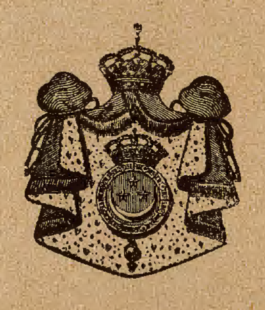
TOME XX. — 1er FASCICULE.

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DE L'INSTITUT FRANÇAIS D'ARCHÉOLOGIE ORIENTALE DU CAIRE

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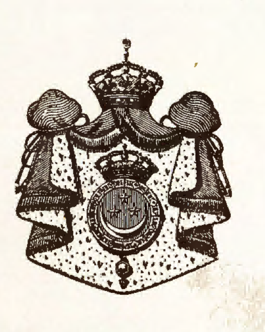
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D'ÉGYPTE.

A CONTRIBUTION

TO THE

GEOGRAPHY AND CARTOGRAPHY

OF NORTH-WEST YEMEN

(BASED ON THE RESULTS OF THE EXPLORATION

BY EDUARD GLASER, UNDERTAKEN IN THE YEARS 1882-1884)

BY

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CONTENTS-SUMMARY :

FOREWORD.

This treatise deals with the work of a man who was lost to science much too early through his premature death. Eduard Glaser gained an extraordinary knowledge of south-west Arabia. This is confirmed by the description of his 1st expedition and the publication of its extensive results on the geographical regions. Although almost half a century has gone by since then, his work still retains its worth. His accounts can seldom have been bettered. A large part of the region explored by him has still to be visited by any other European. These things can been seen quite easily from a perusal of the still unpublished journals of Eduard Glaser, when their geographical content is examined and evaluated. The author hopes thereby to have given a valuable contribution to the opening-up of Arabia.

The ground-work for this is formed by the "Geographischen Forschungen in Jemen" described by the great Arabian explorer in diary form. They are the property of the Vienna Academy of Science. I was able to go through the important material with the kind assistance of Prof. Dr. Adolf Grohmann of Prague. I should like to record at this point my deepest thanks to the Vienna Academy of Science. Dr. Adolf Grohmann has encouraged my activity to the greatest possible extent and has always been forthcoming with his valuable advice. He provided me with a grounding in Arabic, and was of particular service in the execution of the names in the Arabic script.

I could not have succeeded in carrying out the Arabic edition of the map without his assistance. I owe him therefore my especial thanks. In the same way as they belong to my teacher of geography Prof. Dr. Bernhard Brandt.

In conclusion I may add that a reproduction of the map in European script, accompanied by a short text, has already been published in 1934, in No. 5 of the journal, *Petermanns Geographische Mitteilungen.* On this the expeditionary routes of Glaser were particularly shown. The publisher, Justus Perthes has very kindly given me the permission to reproduce the map. I owe to him, therefore, and to the editor of the aforementioned journal, Prof. Dr. Langhans, my sincerest thanks.

Further, by having translated into Arabic the cartographic results of Glaser's explorations, I hope to have done a service to the Arabic World and to have encouraged the interest in Glaser's personality.

Dr. Josef Werdecker.

Prague, in December 1937.

INTRODUCTION.

AIM AND ARGUMENT OF THE THESIS AND REMARKS ON SAME.

The problem of the present thesis, confronting the author, was to consider the possibility of a cartographic representation of the region in that part of north-west Yemen visited in the years 1882-1884 by the explorer Eduard Glaser, based on the material provided in the "Geographische Forschungen in Yemen" and—if this possibility existed—to carry out such a representation. The afore-mentioned manuscript is the first to be written up by Glaser from his descriptive journals after returning from the actual excursion into the interior of the territory of Ṣanʿâ. These journals are no longer extant, and therefore it was not possible to trace back to them. Apart from the proper names, which were written in modern transcription of the Arabic characters, the text was presented in 284 closely written pages of Gabelsberg shorthand. In the course of the journey and the events during it, all the measurements undertaken and every phenomenon, connected in any way with the topography and physical geography of the territory, were noted down. 40 neatly executed sketches complete the picture.

After going through the available material, the cartographic work on the explored region could be set out. This resolution was easier to understand, in view of the fact that, after a close comparison with the existing map-productions, these showed a series of errors to be corrected: namely, the resolution that it would be worth while to draw up a new map in every case. The fulness of the particulars allowed the construction to be on the comparatively large scale of 1:100,000. It appeared later on, that even this scale was scarcely extensive enough to include all the objects described, and a crowded representation resulted. On the other hand, in representing the regions not actually touched on the direct route, there naturally appeared gaps. In general however, the scale chosen was conformed to.

During the setting-out of the various geographical features on the drawing-sheet with the help of many, very accurately measured angles between them, it was seen that there had not been attained a sufficiently

close correspondence to the astronomically fixed points. Firstly, after a long and difficult interval, the position of the latter was successfully altered, so that the statement giving the angles might be given accurately and in full. This proceedure is justified by the fact that the astronomical instruments had been damaged on one of the excursions. The angles are reproduced in tabular form in the appendix to the written thesis. A separate chapter is devoted in that part of the text in question to the accomplishment of the map-work and to the existing sources for it. Similarly, a separate part is reserved for a comparison between the map constructed and such existing maps as touch on the region concerned. Together these form the 2nd part of the written work. The rest of the text followed naturally, of itself. Since Glaser, as no other explorer before him, collected such a mass of observations of a geographical nature in his manuscript, it was easy to write up the rest of the text. The method chosen for the description of the routeway was to bring in the geographical facts at the points where they were observed. A bare enumeration of names in describing the routeway is thus avoided. At the same time and in the same way, can be presented the regions which were passed through. The copious nature of the material enables this chapter to be greatly enlarged. It forms the greater section of the 1st part of the written work. The preceding and following chapters give a sketch of Glaser's life, and indicate his exploratory work in the later expedition. They should to some extent serve in making known his scientific activity.

The first part, which presents the story of the exploration of north-west Yemen, deals with the fact that Glaser had to proceed into an almost unknown region, and that his preformance has hitherto been unsurpassed.

The present thesis has, therefore, been almost entirely put together from source materials, and is widely based on a use of literature. Only in the 1st part can it be referred to in footnotes. It is summarised at the conclusion of the work. Of the numbers bracketed in the text, the first mean literature referred to and the second, the number of the page quoted.

In order to have a survey of Eduard Glaser's activity as a scholar, his published works have been cited at the conclusion. Likewise, there is to be found a complete list of the works consulted on the geography of

south-west Arabia. An endeavour was made to produce a list as comprehensive as possible.

On the corresponding pages are the photographs of the 7 original sketch-maps of Glaser, by which the explorer's method of work is made obvious.

EXPLORATION OF THE REGION UNDER CONSIDERATION.

In Ancient Times and the Middle Ages, no one in Europe had an accurate knowledge of our region. In Ptolemy's description of Arabia (2nd century after Christ) all the localities known by hearsay were distributed uniformly within the framework of the peninsula. Only with difficulty can a correspondence to the actual state of things be made out. Similarly, the works of the mediaeval Arab geographers give a most incorrect picture. Their present-day value lies more in the sphere of history and language. Nevertheless, it is of interest that the most important localities in the region of Southern Arabia under discussion were known to Idrisi (Description of the World, 1154).

The first exploration of Yemen by a European took place in the year 1508. In that year, the Italian, Ludovico di Barthema of Bologna, landed in Aden, was taken, however, to be Christ, and held by the overlord of the territory for 3 months in captivity in the mountains of Yemen. On being set free, he travelled for a long time through Yemen, and visited several cities, including the capital Ṣanʿâ. The account of his journey, however, included mostly only personal adventures. He described only slightly the land and people. According to Carl Ritter, his accounts were «for the time, quite noteworthy, but containing only passing information, little of geographical use, more a story of a strange fate»[1] (23,3-18,5)[2].

The first journey of exploration to produce results of scientific value was that of Carsten Niebuhr in the years 1761-1767. The expedition

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(1) Ludovico di Barthema, *Itinerario, Libro II, dell'Arabia felice*, c. I-XV, fol. 152-155 in G. B. Ramusio, *Raccolta delle Navigazioni*, Venezia 1563, fol. t. I.

(2) See the literature refered to the treatise.

was ordered by the Danish King, Frederick V. Besides Lieut. Carsten Niebuhr, the orientologist Chr. v. Haven, the naturalist Peter Forskâl, the doctor Chr. Carl Cramer and the artist Georg Wilhelm Bauernfeind, also took part. Haven and Forskâl succumbed to the extremities of the journey before Ṣanʿâ had been reached. The two remaining comrades died in the following year, and Niebuhr alone finished the venture in accordance with the plan arranged. Ritter says that this is the most complete and carefully considered journey ever carried out by European in Yemen. Furthermore, Hogarth pays a very high tribute to the explorer on his results. The great travel-work[1] is not yet obsolete as regards Yemen. The topographic, cartographic, naturalistic and ethnographic observations and notes make the journey so valuable. The map devised by Niebuhr was used again by later travellers. The region north-west of Ṣanʿâ, with which we are concerned, is actually included. The accompanying representation shows a considerable improvement on the aforementioned map. Although Niebuhr collected no inscriptions, he was the first European to see the old script of southern Arabia, and to direct, through his account, the attention of later travellers to those places where such inscriptions might be found[2]. Through him, the ancient science and culture region of Southern Arabia were made known. The results of the expedition, apart from an abundance of archaeological material, were a collection of valuable facts (23, 4-5—18, 1-4).

Following on the account of Niebuhr, the Russian Staff-assessor U. J. Seetzen looked for old Arabic inscriptions. He was successful in advancing as far south as Ṣanʿâ in 1810. Moreover, south, of this town, he had some real success. The disturbed political situation of the times, however, resulted in his disappearing without leaving a trace. So also were his large plans to go to Mârib and to Ḥaḍramaut destroyed. How far he actually did go on his journey is not clear. The rest of his drawings were discovered later in various parts of Yemen. Only a few letters

[1] Carsten Niebuhr, *Beschreibung von Arabien*, Kopenhagen 1772. *Reisebeschreibung nach Arabien und anderen umliegenden Ländern.* I. Kopenhagen 1774, II. Kopenhagen 1778, III. Hamburg 1837.

[2] Niebuhr, *Beschreibung* p. 94, *Reisebeschreibung* p. 400, 409, 427.

and some inscriptions were sent by him to Mocca, whence they then came to Europe and were published[1] (23, 5-8—18, 6).

In the following years, the tragic story of Seetzen unfavourably influenced a similar expedition. It was in 1836 that the English naval officers, Hulton and Cruttenden, who carried out a survey of the south coast, first undertook an excursion to Ṣanʿâ. They went chiefly by the same route that Niebuhr and Seetzen had taken before them, and confirmed their observations. Later, the scientific results of Cruttenden's journey were made public[2] (23, 5-8—18, 6).

In the same year, the German-Jewish missionary, Joseph Wolff, made use of the same route from Mocca to Ṣanʿâ. He brought back neither epigraphic nor geographic material. His purely religious interest induced him to collect only details of the peculiarities of the peoples of the region (23, 11).

Some subsequent expeditions to southern Arabia visited the southern and south-eastern parts of Yemen, and therefore do not come into consideration.

The courageous journeys of the French apothecary, Joseph Thomas Arnaud were of decided importance in regard to the ancient epigraphs of Yemen. In 1843, he was successful as the first European in going on through Ṣanʿâ and reaching the capital of the kingdom of the Sabis, Mârib, which was known only by legend. He was able to achieve great results, since he helped the Imâm of Ṣanʿâ as apothecary and so meet with full confidence. A trustworthy guide and attendant made the undertaking possible. His courage and strong will triumphed over all difficulties. His interest lay exclusively in the Sabi inscriptions. Having experienced many dangerous situations, he returned to Ṣanʿâ with a wealth of interpretations. The French scholar and consul, Fresnil, read the account of the explorer, whose collection of inscriptions and

[1] V. Zach, *Monatliche Correspondenz*, 1813, vol. 27 and 28. *Fundgruben des Orients*, Wien 1811, vol. 2, p. 275 ff.

[2] Charles J. Cruttenden, *Narrative of a Journey from Mokka to Sana* in *Journ. R. Geog. Soc.*, vol. 8, p. 267 ff.—*Journal of an Excursion to Sana* in *Proc. of Bombay Geog. Soc.*, 1838, p. 39 ff.

commentary thereon written by him were published [1]. Since Arnaud's routeway extended eastwards of Ṣanʿâ, his expedition is hardly of interest to us (23, 15-20—18, 9-11).

Of interest is a collection, made by the English colonel COGHLAN commencing is his 60th year, of bronze tablets of the Sabic Age, for these were almost entirely derived from ʿAmrân, one of the chief places with which the thesis is dealing (18, 12).

That district of Yemen stretching in a north-westerly direction from Ṣanʿâ was traversed by Joseph HALÉVY in 1870 for the purpose of collecting old inscriptions. He had been commissioned by the Paris Académie des Inscriptions et Belles-Lettres, which had in 1869 resolved upon the publication of the *Corpus inscriptionum Semiticarum*. Disguised as a native Jew, it was possible for him to enter the inaccessible regions of southern Arabia. He was the first European to succeed in advancing from Ṣanʿâ to the N.E. into the Ǧôf, where he discovered the ruins of the old Neǧrân. Through him, an entirely new meaning was given to the origin of one of the oldest Arabic stories. Knowledge of the Minaean Empire extends back to it. A great work on inscriptions was handed over as a result of the exploration to the Academy. As early as 1872 and 1873 he had published the results, accompanied by an account, of his journey [2] (23, 21-28—18, 12-14).

Up to the present, these regions have been further explored by no European. Halévy's routeway lies almost entirely outside the region concerning us. Nevertheless, his name must find its place here, since it forms a mile-stone in the exploration history of southern Arabia.

In 1873, Charles MILLINGER journied from Ḥodeida to Ṣanʿâ [3] (23,28).

From 1877-1880, the Italian Renzo MANZONI sojourned in Turkish

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[1] *Journal asiatique*, 4e série, t. V, Paris 1845 : *Relation d'un voyage à Mareb (Saba) dans l'Arabie Méridionale*, entrepris en 1843 par M. Arnaud, p. 211-245, 309-345.

[2] *Journal asiatique*, 6e série, t. XIX, Paris 1872 : *Rapport sur une mission archéologique dans le Yémen*, par M. Joseph Halévy, p. 5-98, 129-266, 489-547. *Bulletin de la Société de Géographie*, 6e série, t. VI, 1873 : *Voyage au Nedjrân*, p. 5-31, 249-273, 581-606.

[3] Charles MILLINGER, *Notes of a journey in Yemen*, Proc. of R. Geog. Soc., 1874.

Yemen. In his account on the regions south of Ṣanʿâ were described. The capital receives more comprensive consideration. Manzoni was the only explorer who put a town-plan with the account of his journey. It was first corrected by two Germans in recent times [1] (23, 28—19, 239).

In 1879, the Jewish antiquary SCHAPIRA traversed the region that interests us, but his account contains nothing of scientific importance (23, 29).

In 1882, the Austrian Siegfried LANGER went to Ṣanʿâ. He was prevented by the Turkish Governor from making extensive excursions into the interior of the country, on account of being afraid for his safety. Shortly after, the young explorer had to pay with death for his daring (23, 29—18, 17).

The year 1882 saw a big contribution to the history of the exploration of southern Arabia. If introduced an entirely new epoch, marked by the personality of Eduard GLASER. The results of his explorations by far surpassed those of his forerunners. His life's work will be presented in the next chapter and, in a separate section, the nature of his scientific research will be indicated by a careful description of his 1st journey of 1882-1884.

After Glaser, only a few men have possessed the courage to penetrate in to the interior of Yemen. The difficulties to be surmounted, above all the mistrust of the natives and the savage feuds between the individual tribes, made it almost impossible to enter southern Arabia for the purposes of exploration. Moreover, on account of the dangerous conditions, the Turkish Governor gave permission only rarely for such a purpose. The results of the expedition, relating to the region being considered by us, are of no great importance. Far better results have been obtained in recent times. The names of the persons in question will here be presented. Only a few succeeded in getting beyond Ṣanʿâ.

The missionary F. T. HAIG got as far as that town in 1887 [2].

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[1] Renzo MANZONI, *El Yemen, tre anni nell'Arabia felice. Escursioni fatte dal Settembre 1877 al Marzo 1880*, Roma 1884.

[2] F. T. HAIG, *A Journey through Yemen*. Proc. of R. Geog. Soc., IX, 1887.

In that year, too, occured the expedition of the French botanist M. A. DEFLERS. He advanced far to the N. W. of the capital and reached Kaukabân, Šibâm and ʿAmrân. His accounts are of purely technical interest [1].

In 1892, the Englishman, W. B. HARRIS went from Aden to Ṣanʿâ and returned to Ḥodeida [2].

The excursions of the Italian, G. B. ROSSI, in 1891 and 1906, were interested in colonial politics. The centre of Yemen was always their aim [3].

In 1898, P. CHARNAY was able to get from Ṣanʿâ to Kaukabân [4].

In the years 1902 and 1909, took place the excursions of the German, Hermann BURCHARDT. In the region which interests us, the chief places, such as ʿAmrân, Šibâm, Kaukabân and Bejt ʿIdâḳe, were visited by him from Ṣanʿâ in 1902. The photographs taken by him are especially valuable [5]. On the 2nd journey, made through the regions lying southward of Ṣanʿâ, he, with his companion Benzoni, was murdered by the natives [6].

The efforts of the French engineer, A. BENEYTON, between 1909 and 1912, were of importance. He was the leader of a commission appointed by the Turkish Government to prepare plans for the construction of a railway from Ḥodeida to Ṣanʿâ [7]. The preparation, on this basis,

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(1) A. DEFLERS, *Voyage au Yémen,* Paris 1889.

(2) W. B. HARRIS, *A journey through the Yemen, and some general remarks upon that country,* London 1893.

(3) G. B. ROSSI, *Un escursione nell'Jemen durante l'insurrezione del 1891,* Catania 1894. Nell'Jemen : impressioni di viaggio, note e ricordi; *Rivista coloniale,* II, Roma 1906.

(4) P. CHARNAY, *Une excursion au Yémen. Bulletin de la Société de Géographie d'Anvers,* XXIII, 1898, p. 79-96.

(5) Hermann BURCHARDT, *Reiseskizzen aus dem Jemen. Mitteilungen der Gesellschaft für Erdkunde,* Berlin 1902, p. 593-610.

(6) *Aus dem Jemen,* Hermann BURCHARDTS *letzte Reise durch Südarabien, bearbeitet von Eugen Mittwoch. Festgabe für den 4. Deutschen Orientalistentag in Hamburg,* Leipzig 1926.

(7) A. BENEYTON, *Mission d'études au Yémen. La Géographie,* XXVIII, p. 201 ff.

of a careful routemap, went hand-in-hand with his desire of getting a thorough idea of the terrain. On account of the great difficulty arising from the opposition of the district, the construction of the track came to nothing. The precious map, on the scale of 1 : 250,000, was deposited with the Royal Geographical Society in London, unpublished. A small section of the way from Ṣanʿâ to ʿAmrân has however been dealt with from it, particularly arousing our interest.

For many years, the Englishman, G. Wyman BURY, lived in south-west Arabia, and, with a discerning eye, got to know the land and people well. He was able to make some important observations, which he put together in a publication of real merit. Particularly instructive are the photographs accompanying it. The author's considerations are also of importance to our region. A whole chapter is devoted to the capital, Ṣanʿâ alone [1].

After the Great War, in the winter of 1922-1923, an expedition to Yemen was undertaken by the Frenchman, P. LAMARE. As companions, he had his fellow-countryman, M. V. Cherruau and the American engineers, M. M. Ely and MacGovern. The region explored by them lay to the south of Ṣanʿâ [2]. In 1929, Lamare succeeded in once more setting foot in south-west Arabia, and in becoming more accurately acquainted with several parts. It is important that, during the 1st half of the journey, Ḥaǧe, Koḥlân and ʿAmrân should have been visited—and hence also regions—which were visited by Glaser on his 1st great journey, and therefore a good description of the map under discussion should be found. The description of the geographical phenomena observed on route offers a series of interesting details concerning it. The photographs accompanying the essays in reference to them illustrate this little-known land very well [3]. Nevertheless, Glaser's accounts were corrected only to a small extent by the explorer. They are essentially of a mineralogical and geological nature. The collections, put down

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(1) G. Wyman BURY, *Arabia infelix or the Turks in Yamen,* London 1915.

(2) P. LAMARE, *L'Arabie heureuse : le Yémen. La Géographie,* 1924, No. 1, p. 1-23.

(3) P. LAMARE, *Résultats géographiques d'une mission au Yémen. La Géographie,* 1930, No. 5-6, 1931, No. 1-2.

in the aforementioned essays, were valuable. Gaps in the knowledge of the country were substantially lessened.

In 1927, a journey of exploration was made in Yemen by two Germans. Hermann v. WISSMANN and Carl RATHJENS had actually permission to make only a short stay in Ǧidda, but got as far as Ṣanʿâ however, from which place they were able to carry out smaller excursions, for the purpose of making geographic, meteorologic and linguistic surveys. Archaeology, also, was not forgotten. Ancient inscriptions were copied down, and a sun-temple at el-Ḥukka was excavated. From the town of Ṣanʿâ a careful chain-and-compass traverse, assisted by aerial survey, was made. This was presented, on the scale of 1:13,000, with the very informative essay written by the two explorers [1]. They were able, furthermore, to make some sketches of the environs of the capital. In view of the fact that the Imâm had granted permission for a visit to the places of el-Hukka, Ḥâz and el-Gherâs together with the surrounding ruins, it was therefore possible for Rathjens and Wissmann to get to know a small part of the region explored by Glaser. Their accounts correspond quite closely with thôse of Glaser. The explorers, unfortunately, were unable to obtain permission from the Imâm to make a journey into the Gôf. As their plans were wrecked and there was no possibility of journeying by the Yemen Road to Aden, they returned in mid-March, 1928, to Europe via Ḥodeida. The scientific results of the expedition were published in three volumes [2]. The various aspects of the region explored were treated

[1] Carl RATHJENS und Hermann v. WISSMANN, *Sanaa. Eine südarabische Stadtlandschaft, Zeitschrift der Gesellschaft für Erdkunde zu Berlin,* 1929, p. 329-353.

[2] RATHJENS, v. *Wissmannsche Südarabien-Reise,* Band 1 : *Sabäische Inschriften.* Bearbeitet von J. H. MORDTMANN und Eugen MITTWOCH, *Hamburgische Universität. Abhandlungen aus dem Gebiet der Auslandskunde,* vol. 36, series B vol. 17, Hamburg 1931.

Ditto, Band 2, *Vorislamische Altertümer.* Bearbeitet von Carl RATHJENS und Hermann v. WISSMANN, *Abhandlungen aus dem Gebiet der Auslandskunde,* vol. 38, series B vol. 19, Hamburg 1932.

Ditto, Band 3, *Landeskundliche Ergebnisse von* Carl RATHJENS und Hermann v. WISSMANN, *Abhandlungen aus dem Gebiet der Auslandskunde*, vol. 40, series B vol. 20, Hamburg 1934.

very thoroughly. Most interesting geographically is the third volume. It contains a wealth of geographical observations. The capital, Ṣanʿâ, is carefully described in an individual chapter. A series of fine photographs give a vivid idea of the country. The two Germans completed Glaser's exploration of the immediate vicinity in a most valuable manner (20, 1-12).

A fresh expedition was made by them early in 1931 to southern Arabia, accompanied by the Dutch consul van der Meulen. A fruitless attempt was made to push on from Aden to Ṣanʿâ. The scene of their labours was therefore the region of Ḥaḍramaut [1].

Similarly in the year 1931, Rathjens made an unaccompanied journey from Ḥodeida via Ḥaǧe and ʿAmrân to Ṣanʿâ. At the last place he established a meteorological station, which has carried on observations to the present day. He returned to Ḥodeida by way of Kaukabân and Tawîla.

In 1934 and 1937, Rathjens again went to Ṣanʿâ. He took, however, a route not followed by Glaser's first expedition. There is nothing yet published on the last three journeys.

In 1932, the Czechoslovak journalist, M. A. Brikcius, accompanied by his wife, visited Yemen. He became a convert to Islam (at present he is head of the Society for Islamic Culture in Prague), succeeded in penetrating to Ṣanʿâ, and was received by the Imâm Jahja in person. He has recorded his impressions in a popularly written book largely occupied with ethnographic material [2].

Finally, note must be made of the expeditions of the German Hans HELFRITZ. He reached Ṣanʿâ in the years 1932 and 1933. On the second journey coming east out of the wâdi Ḥaḍramaut into the capital of Yemen, he was taken prisoner. He was conveyed to Ḥodeida without having been able to study the neighbourhood of the capital. The marvellous Leica photographs in his popular books have given rise to wonder. These include a number of pictures also of Ṣanʿâ [3] (12, 97-193).

[1] Van der MEULEN, D. and H. v. WISSMANN, *Hadramaut. Some of its mysteries unveilled,* Leyden 1932.

[2] HADŽI MOHAMED ABDALLAH BRIKCIUS, *Vzáři půlměsice,* vol. I, Yemen, *země tradic.* Praha 1934, Friends of the Orient Club.

[3] Hans HELFRITZ, *Land ohne Schatten,* Leipzig 1934.

In March 1936, Ettore Rossi made the journey from el-Ḥodeida to Ṣanʿâ and back. From the point of view of our region, his work is of small value [1].

Of greater importance is the expedition sent in 1936 by the Egyptian University to Yemen and Ḥadramaut. It took place this year from April to November, collecting much very valuable material, which it will take still some further time to be published. The expedition was organised by the Dean of the Natural Science-Philosophy Faculty, Prof. Dr. Ṭâḥâ Ḥusain-Bey, and conducted by Dr. Ḥuzayyin. The geography professor of the university, Dr. Muṣṭafâ ʿAmer-Bey, likewise made a large contribution to the expedition. The regions explored by Glaser on his 1st journey around ʿAmrân, Reida and Nâʿiṭ have thus once more been visited. The scientific work is certainly very extensive, and the publishing of the results is naturally awaited with much interest.

As we have seen a large number of explorers have got as far as Ṣanʿâ. Only a few have travelled from that place to the north-west. The copious works of Glaser on this region are therefore the more valuable and their extensive results are correspondingly assessed the more highly.

BIOGRAPHY OF EDUARD GLASER.

Eduard Glaser was born at Deutsch-Rust in the district of Podersam, Bohemia, on March 15th, 1855. In 1868, his parents moved to Tronitz near Saaz, where they had bought a little farm. After attending the elementary school at Liebeschitz and Litschkau, he was taken to the junior secondary school at Komotau (27, 1). Owing to financial difficulties, he was then obliged to take on a clerkship (24, 6). The 16 year-old youth thought, however, that he was suited to the continuance of study, went on his own account to Prague and attended the high-school there (24, 6). The cost of his education kept him needy. Despite this, besides his work and to the detriment of his health, he carried on the study of Italian, Spanish and English for the school (9, 1).

[1] Ettore Rossi, *Appunti di un viaggio nel Yemen. Bollet. R. Società Geografica Italiana,* ser. VII, vol. II, nos 2-3, Roma 1937.



EDUARD GLASER
(15 mars 1855 - 7 mai 1908)

Better conditions set in for him when he was appointed private tutor to the son of Baron von Docteur (26, 1). The reading of the periodical "Das Ausland", and especially the account in it of Livingstone's expeditions, awakened in him an interest in unexplored lands and strengthened his resolution to become an explorer himself. Henceforth his studies served only to the realisation of his aims (24, 6). He commenced to occupy himself with astronomy and to learn foreign languages with fervour. He gave himself up to these things with such enthusiasm that he felt school to be more and more of a burden (9, 1). He left the latter in the summer of 1873 without a certificate, and, almost entirely on foot, made his first important journey to Paris. By October, he was back in Prague, got his leaving certificate from the high-school, and from here went to the polytechnic, where he entered into mathematical, physical and geodetic studies. At the same time, he busied himself vigorously at the University with Arabic (9, 1). He was very much liked there by the professors because of his knowledge, and they encouraged him to take part in the 2nd International Geographical Congress (27, 2). He took up this idea gladly, and in 1875 put it into actuality. Within 19 days, he once more travelled on foot to Paris. His strong will helped him through all the difficulties that could arise for a German not speaking the French language well. Provided with a botanical specimen-case and the scantiest of apparel, he carried out his intentions (26, 2). The keeper of a suburban inn, to whom he explained his situation, let the Congress Committee know at once of his arrival. Thither the Prague professors be took themselves, accompanied by several prominent members of the Congress, such as Schweinfurth, Nachtigal and Weyprecht, and through them he was thus introduced into the sphere with which he had wished to become acquainted (27, 3). He was put forward by them, and invited by other professors, to take part in a coming expedition. From that moment his great instinct to explore was aroused, never more to leave him[1]. He was persuaded on this occasion, however, by his

[1] These events were pointed out, because they indicate what a prominent geographic interest Glaser had even in his youth, and because he was specially stimulated by those days right through to his later journeys of exploration.

parents and their other children, not to go (27, 3). He finished his three years course at the polytechnic high-school, carried out his one-year course and in the autumn of 1877 went to the university of Vienna (24, 6). A. Wahrmund was his tutor in Arabic, to which study he particularly devoted himself. In the following year, Edmund Weiss introduced him into the observatory, and soon promoted him to be his assistant (24, 6). Here he acquired the grounding in astronomical science which he was able to use later on his expedition. Several invitations to join scientific expeditions he refused, as not fitting in with his plans. The Austrian branch-committee of the International Association of that time, for example, invited him to accompany an international exploration to the Congo as the Austrian representative (24, 7). Further, he was urged to journey to South Africa with Holub. For a great many years, he was particularly attracted only to the Arabic countries. For these, he had made the necessary preparations by way of studying the languages. In 1880, he made the acquaintance of H. Müller, an honorary lecturer, who encouraged him in the exploration of southern Arabia, and made him more conversant with the subject of inscriptions (9, 1). His idea of going to Yemen became more and more defined. He saw, however, that only a profound knowledge of the language and the special conditions of the country would bring him success, and so he applied to the Austrian Consul-General in Tunis for appointment as tutor to the latter's children. Approval was willingly given. Glaser was now able to study the language, manners and customs of the Arabs at first hand by which he profited on his following journeys. He soon mastered Arabic so thoroughly that he was able to become an interpreter (17, 145). At the beginning of 1882, he left Tunis. He next went to Upper Egypt in order to observe an eclipse of the sun and to study the country and peoples. After this, he stayed for a longer time in Alexandria and Port Said, working at the Austro-Hungarian Consulate and rendering many services to his government (17, 146). He then secured the help of the Paris Academy and went on travels according to his own particular plan. Now came the time of his great expedition, which is described in detail in the next section. During his residence in Europe, he had already used the intervals between his travels for scientific work. He

continued to do this after his return from the final expedition. He was especially taken up with the study of his extensive collection of inscriptions. The manuscript of the work wherein he dealt with a vast number of ancient and modern texts, grew larger and larger. Glaser devoted his entire strength to this task in the last year of his life (17, 177). The desire for a peaceful life, after his many hardships, was not to be fulfilled. He took his doctorate honoris causa at the University of Greifswald in 1890, was a member of several learned bodies and his opinions were listened to carefully by different circles (17, 170). What he had always hoped to receive, did not come about. He was never offered a chair at a university. In particular, the objection that he had not undergone a regular course of training was always maintained. He had acquired the greater part of his extensive knowledge by means of self-tuition (17, 173). He could have taken up the post of teacher of Arabic at the Vienna School of Oriental Languages (17, 175). The remuneration was so poor that he refused it. By the sale of inscribed stones, antiques, valuable ethnographic objects and costly manuscripts that he had brought back with him from southern Arabia, he was able to maintain himself for a number of years after returning from his expedition. Once more, although living very frugally, he was obliged to worry himself about his upkeep. It is not to be wondered at that he should feel slighted and oppressed. His embitterment increased year by year, and finally he became possessed by the idea that his enemies were systematically persecuting him. He was on particularly bad terms with the Viennese professors (17, 168). The Arabic experts, David Heinrich Müller of Vienna, and H. Derenbourg of Paris, he attacked most vehemently. He bore them a particular grudge as he had achieved no comparable place in the scientific world for his activities. The explorer's learned works, too, are often full of polemics, in which the real point of the argument is forgotten and displaced by personal grievances (9, 14). In this way he did himself great harm. His works were considered frequently disjointed and their scientific worth correspondingly devalued. It so happened therefore that he could not display his great abilities to their full extent. He missed a peaceful life. He worked on his enormous thesis on inscriptions until he was completely exhausted, in the hope of happier days when it

was published. Such were denied him. Calcination of the arteries began to affect him (17, 178). In the middle of November, 1907, he was for the first time troubled by an attack of suffocation. These attacks became more frequent. He bore the serious illness bravely. The mental torment of being confined was, for him, most severe. In the end he faced death calmly. On the evening of May 7th, 1908, he was released from his sufferings (17, 179). Excessive work had, most certainly, brought him to this premature end. In his last year, he had made peace with his rivals. Secured by the conditions of a treaty, he would now have been able to make a stay in Ṣanʿâ (9, 14). It borders on the tragic that he should be snatched away from the services of science at the very time when, at last unrestricted and provided with the necessary means, he could have carried out his explorations in Yemen.

DETAILED DESCRIPTION

OF THE EXPLORER'S FIRST JOURNEY

AND OF THE GEOGRAPHICAL PHENOMENA OBSERVED THEREON.

As soon as Eduard Glaser saw the certainty of the funds necessary for a great expedition, he set out on his first journey for southern Arabia. David Heinrich Müller of Vienna had had only a moderate success in raising funds. He was able to collect only 1250 fl. for the explorer while he was staying in North Africa (24, 7). The Paris Académie des Inscriptions et Belles Lettres had been won over to support Glaser's route-plan, and had put at his disposal a sum of 6000 francs, on the condition that the scientific results should become the property of the Académie (24, 7).

On September 30th, 1882, Glaser left Port Said on board the Austrian steamer, *Memfi*. He arrived at Ḥodeida, via Ǧedda, on October 11th 1882 (9, 2). His position was not exactly very agreeable. The murder of Siegfried Langer, immediately preceeding, had, as a consequence, filled the Turkish authorities with a general distrust of foreign travellers. The Governor General of the time, Marshall ʿIzzet Paša, sent word to him that orders had been received from Constantinople to the effect that nobody might travel in Yemen without the special permission of the Sultan himself. By this decree of the Porte, the explorer was condemned at the outset to inactivity in Ḥodeida. He immediately took steps to get the necessary certificate of permission (fermân). On top of all these misfortunes, he succumbed to fever, which, however, his robust constitution throw off in a few days. After several weeks, he was allowed at least to go to Ṣanʿâ as a private person. He was forced to leave his scientific instruments behind him in Ḥodeida (9, 2).

Following the usual route, of which he made a topographic description on his 2nd journey, Glaser departed for Ṣanʿâ, arriving there on the evening of November 6th (9, 2). Here, he met two Greeks, who made friendly overtures to him. On November 9th, he was given an audience by the wâli (governor), who received him very amiably and showed a lively interest in his activities as explorer. He professed himself to be, then and always, his appreciative patron. As long as the permit from Constantinople was not forthcoming, Glaser was not, of course, allowed to leave Ṣanʿâ. For almost 10 months, he was, after this manner, formally interned in the town. By November 15th, he had been allowed to obtain his scientific instruments from Ḥodeida, and on the 17th, actually permitted to join in a hunting expedition to the garden-town of Rauḍa, lying north-west of Ṣanʿâ (9, 2). Gradually he got to know all the important personalities, such as the administrative and court officials and members of the General Staff. He was very pleased to make the acquaintance of the German physician, Dr. Rosenfeld. In a short time, his ideas and efforts entirely succeeded in winning over the people in authority. This enforced stay was useful to him, "especially as a basis for regular observations of all the meteorological elements, at the rate of 24 readings every fifth day; further for the observation of zodiacal lights visible in those parts, and for a careful enquiry into the geographical position of Ṣanʿâ, which would serve as a starting-point for a more detailed astronomical survey of the interior of the country"[1]. Moreover,

[1] Ueber meine Reisen in Arabien. Vortrag von Eduard Glaser in der k. k. Geograph. Gesellschaft am 26. X. 1886. *Mitt. d. Geogr. Gesellsch.* Wien. vol. XXX. 1887, p. 21.

he encouraged the natives from the different regions to visit him, putting all kinds of questions imaginable to them. The religious and economic conditions of Yemen aroused his acutest interest. A number of records were made of the size and position of the separate tribes, the existing ruins, the history of Yemen and the social structure of the various peoples. Observations on the peculiar manners and customs, the individual trades and the costumes met with, found many comments in his journal. Also must be remembered the information he collected regarding the separate districts, the position of their boundaries, the distances between them and the means of intercommunication between the chief centres. This information must, of course, be accepted with reservation since it is based on very different authorities and could not be checked up personally later.

In the course of time, Glaser was allowed to make small tours in the neighbourhood. Thus, on July 4th, 1883, accompanied by his two servants, he made an excursion into the Wâdî Ḍahr. He left Ṣanʿâ by way of the gate of the Jewish quarter. The village of Maḏbah was left a little on left hand. To reach it, the so-called Bâb Menğel, a passage between black, volcanic mountain ranges had to be negotiated. These bear the name of Sawâd, and form almost a semi-circle. The way led W. N. W. to Šibâm, then turned again more and more northerly, in order to get directly to Ṭaïba. They passed the extensive village of Ḍulâʿ, which lies in the wâdî of the same name. The latter is fertile, and especially productive in corn. The point Ṭaïba was reached by way of the yellow or red sandstone rocks of the Wâdî Ḍahr, without crossing the adjoining, dark-looking mountains. Finally, they passed by the high rock of Fiddeh, which falls away unusually steeply to the north and west. After traversing a small side-valley, they ascended a huge mountain-spur, which breaks away to the north and west into a luxuriously vegetated wâdî. The actual village taked up the southern part of the rock. The northern part, somewhat higher and cut off by a deep trench, is full of ancient ruins. This part of the W. Ḍahr, wich carries water the whole year, can hardly be covered en route in 3 1/2 hours, and extends from Bejt Naʿam to ʿAlmân. It meanders considerably through the standstone mountains, reaching a width of 1000 metres in

its eastern section. Seen from above, the route running down the middle of it resembles a sanded road. Surrounded by clay walls, gardens adjoin it to right and left. The water of the rivulet is led into each to supply the various fruit-trees. A special water-supervisor, the dailî, superintends the distribution. When all the various fruits ripen, between May and July, the luxurious gardens provide a lovely sight. A majority of the farms belong to wealthy residents of Ṣanʿâ, who spend their country vacations here during the vintage time (July-October). Compared with the villages of the plains, which form agglomerations of unwalled, closely-packed houses, the settlements in the wâdî are quite large. The houses and mansions of the distinguished people are built of the lower red sandstone rocks that form the northern boundary. On the southern side, only towers are to be seen. The chief place of the wâdî is Girjet el-Gabîl, which possesses a large market-place and a fine mosque. Mention must also be made of a somewhat smaller village, ʿAlmân, bordering on the northern bank of the wâdî. The latter is no longer covered across its whole width by fields. These extend only towards the left bank. The thinly flowing water ceases even before this, actually almost at the foot of the Ğebl Ḥâğib. The lands farther east have to be contented with wells. Through the middle of the wâdî, which is famous in Yemen, the route goes from Ṭaïba, via Gabîl to ʿAlmân. From here, the party made in the direction of Ṣanʿâ, passing through the villages of Taḳbân, Daḥbân and Ğirâf, and after crossing the Wâdî Suʿub, reached the city.

EXPEDITION TO ʿAMRÂN AND SÛDA.

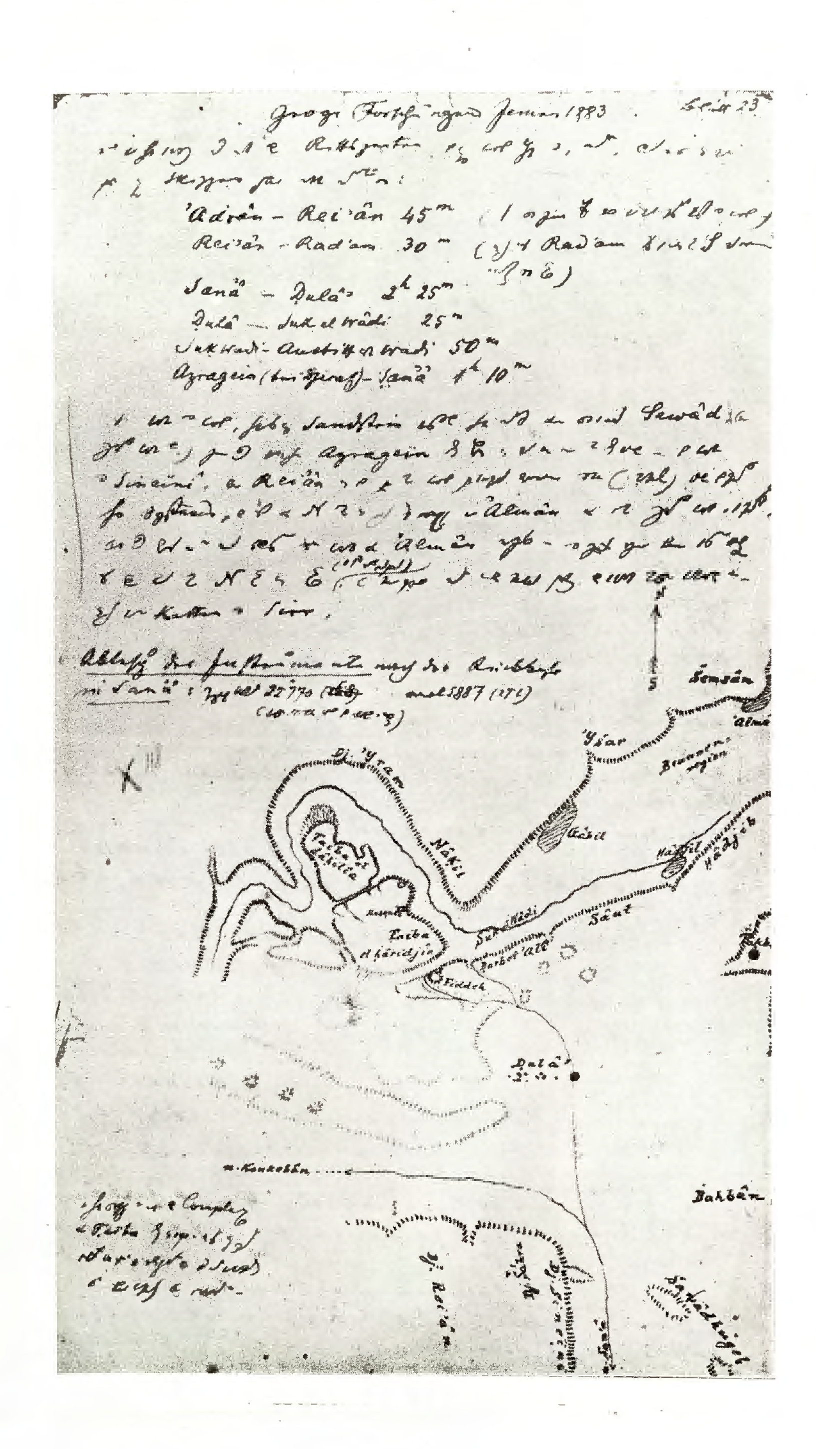
In October 1883, permission to explore the interior of Yemen finally arrived from Constantinople. Glaser had already bought four mules and completed all other preparations. Accompanied by two muleteers and a Turkish police soldier, he set out on his first long exploration on October 16th. After crossing the Wâdî Ḍahr between ʿAlmân and Ğedr, they passed by el-Ḥamme, a mountain composed of black rock. At the place called Azraḳ, a halting-point was made. To the west of this the Ğebl ʿÂn extends north to south, bearing on its most southerly peak the ruins of

Ḥuṣn Lekmân. Thence the march passed to the right of the Ḥâuri-range, then through the cultivated Ḳâʿa er-Riḳḳa, reaching on their northern boundary the village of el-Maʿmer. Here, the soil began to consist of pure lava. After a small wait at a cistern close to Ḍarwân, they moved on eastwards close by a low-lying hill, and after a short climb came to Semsera Ǧerbân, at the foot of the mighty Ǧebl Ḍîn, which commands the region far and wide. The stop was used by the explorer for determining the azimuths of a number of marked points. After Ǧerbân came an easier climb. The way led thence between the village of Benî Maimûn and the Ǧebl Ḍîn. From here began the descent into the broad valley of the Ḳâʿa el-Baun, which follows for the greater part the right bank of the Wâdî Rû. After a long distance by moonlight, ʿAmrân was reached about midnight. Lodgings were found with a Turkish doctor, who lived in the guard-room of the city-gate Bâb el-Aʿlâ. The Turkish functionaries and officers appeared very obliging.

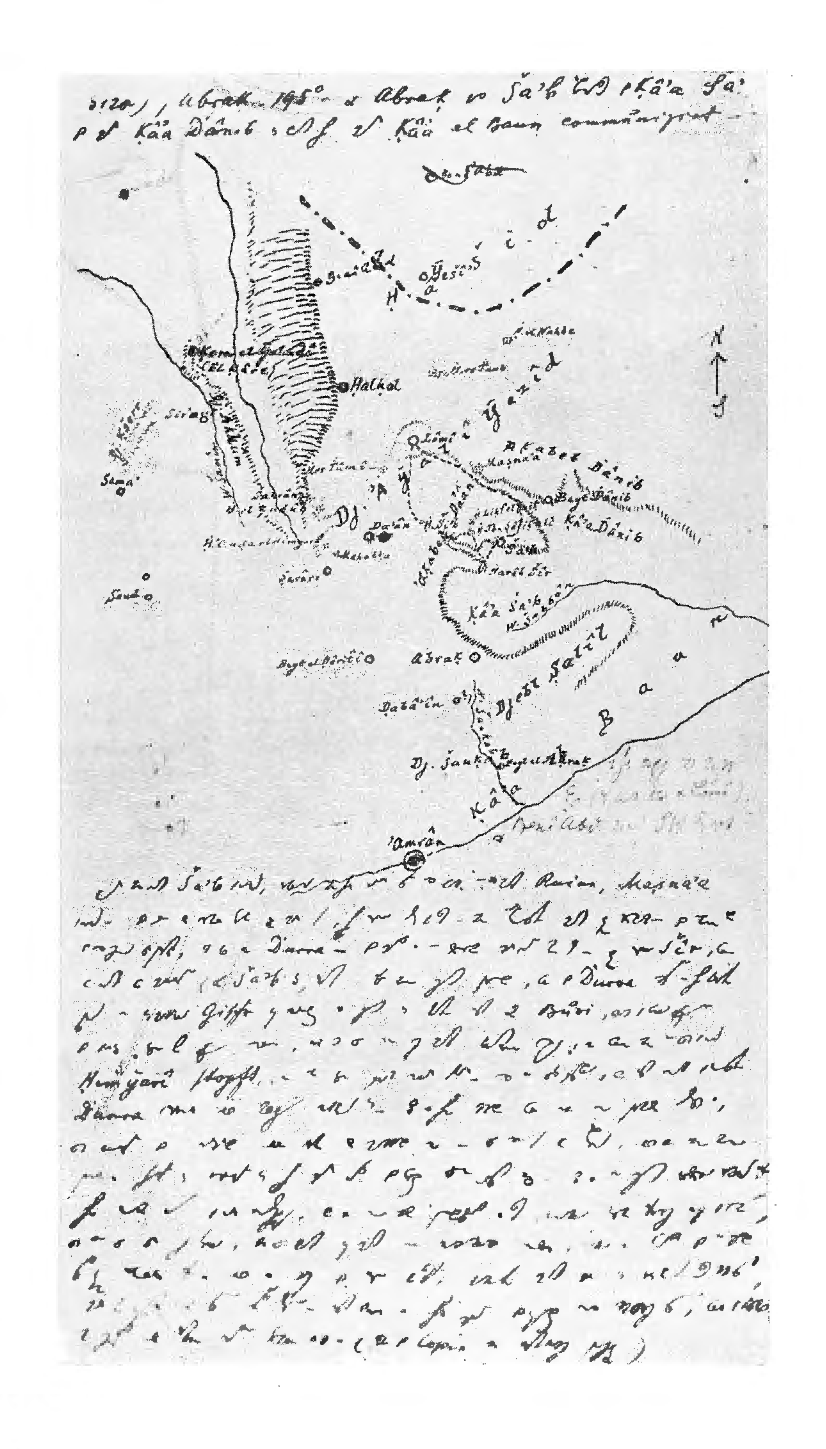
The next day, Glaser observed from the Bâb el-Aʿlâ series of corresponding solar and deduced therefrom the geographical position of the place.

On October 18th a number of azimuthal points were determined. Unfortunately, he was frequently unable to find out the names belonging to them. The Ḳâʿa el-Baun stretches almost exactly S. W.-N. E. It is sharply delimited on the N. W. by higher ranges. Their sizes are very great. Near ʿAmrân, the width reaches some 8 km., and the length almost thrice that. It is extraordinarily fertile. Various kinds of grain, especially barley, are cultivated.

On the same day, he joined a division of troops returning to Ǧebl ʿAjâlî Jezîd. They broke camp early and marched towards the N. E. by the villages of el-Ǧennât and el-Ḳaṣr. At the village of Ẓubr, situated on a mountain projecting into the Ḳâʿa el-Baun, the route turns to the north. The foot of the range bordering the Ḳâʿa el-Baun on the N. W. was soon reached. After more than an hour of awkward climbing up a thread-like river-bed, the party reached a table-land, on which lies the village of Abraḳ. The houses of this village, like those of the nearby settlements, are stone-built, mostly round and carrying towers. Square-built farms are rarely met with. Wells are not to be found. Only cisterns are used, catching the rainwater.



J. Werdecker, *North-West Yemen.*



J. Werdecker, *North-West Yemen.*

From here the route led towards the W. N. W., becoming only a little higher, across a deserted plateau, where they encountered during the day a remarkable rock formation. The surface is widely scattered with massive boulders, as much as 8 cms. in volume. Every one of them shows an innumerable number of cavities. The colour of the rock is light brown. To the right, one looks into the valley which makes a junction with the Ḳâʿa el-Baun. After a slight descent to the N. and a very small ascent to the N. W., they came to a place called Daʿân. After leaving it, the tributary valley of the Ḳâʿa el-Baun appeared again on the right, at the end of which the village of Reida was visible. The route went N. towards el-Lômî. On the way, Glaser met Major ʿAbdullâh Effendi, who, through one of the soldiers with the officer at the camp in el-Lômî, let him enter the place. The commandant was very friendly towards him. The camp of the Turkish soldiers was situated in the western part of the village. The same day, the explorer made a series of meteorological observations. On the following two days, he repeated this performance. Also the astronomical position of a certain point was determined.

On Sunday, October 21st, he measured the azimuths of several points near a cistern which lay to the W. S. W. of the camp, and from which the latter drew its water.

On October 23rd, despite the hostile attitude of the inhabitants of the neighbouring district, he ventured on an excursion to the ruins of Daʿân. The path led to the right-hand side of a S. E. running valley that opens into the Ḳâʿa Ḥamûda, and through the latter, which opens into the Ḳâʿa el-Baun. From the village of Šaʿb the Šîr ruins were visited. Thence, he ascended the mountain-spur to the N. W. and inspected the Ibn Ṣâliḥ Âlî Liḥf el-Ḥaiṭ and eš-Šiʿb ruins. From the last place, he followed up a small wâdî, and, with the Daʿân not far distant on the left, returned to camp. He had not been able to find any ancient inscriptions. The valley-plains in the vicinity of Šaʿb are productive. The grain, ḏurra, is especially cultivated. The hillslopes are protected by a species of giant cactus, known as ʿinab.

The next day was concerned with the ruins near Ṣarâre. Their names are Maḥaṭṭa and ʿAuda el-Ḥimjarî. Since they lie at a very great altitude

and offer consequently a recompensing view, they were used orientation work. From ʿAuda they descended into a valley lying N. of the ruins, up which valley they went as far as the point, where, as already mentioned, the soldiers obtain their drinking-water, and then returned to the camp.

On the 25th October, he was able to visit only the ruins of Ḫarâb eṯ-Ṯaub, which are situated not far to the N. N. E.

The next day was devoted the Ḳaflet el-Ḳuḏûb ruins. These ruins are particularly noteworthy by reason of their magnificent prospect. The district as far as Sûda being spread out before the explorer's eyes like a relief map, he was able to carry out a large number of azimuthal measurements and to make a small sketch by way of illustration. From the ruins, one looked down into a wâdî, having the general direction of W. N. W., shut in by mountains, and bearing along its course the names of Šahrân, Bejt Kilâb, el-Azrûb, ʿOṯmân and Aḥraf. It flows eventually into the Wâdî Môr. On the south of the Ǧebl Ǧurbân, it runs westwards. Parallel to this wâdî but farther west, flows the Wâdî Samîm, which however turns westwards just south of the Ǧebl Maḏraḥ.

On October 27th, took place the departure from Lômî. After a shockingly slow march, caused by the large packs and the transport of a heavy cannon, they reached Ḥalḥale, a place N. W. of Lômî. Here, compass readings of the surrounding localities were again made. Also, the rest of the instruments brought with them were put into use.

The next day, a most violent storm broke out. There followed the descent into the Wâdî Bejt Kilâb to the W., then to the S. W. They passed through the village of Wâdî situated N. W. of the ruins Ḳuḏûb high above it. After a lengthy halt in the valley bottom, they climbed up onto the left bank, reached the ruins of el-Ǧamre, passed the village of Bejt el-ʿAnas built on a rock projecting north-eastwards into the wâdî, followed the eastern declivity of the Ǧebl Maḏraḥ, and finally mounted the summit on which Ḳarn el-Jahûdî is constructed. They went firstly to the Jewish quarter, el-Ḳâre, which lies to the north-east of the village of the Šeiḫ. Glaser took quarters in the Semsera near the birket (water-tank).

The next day he employed in making measurements of the length and breadth of the village of the Šeiḫ, and in determining the azimuths for the «dortige ausgezeichnete Rundsicht». Other things resulting from this stop were a sketch and a detailed description of the surroundings. A short visit was made to the ruins, barely 300 metres distant from Naufân, and situated on a projecting rock. The Wâdî Bejt Kilâb, which is steeply enclosed by rock-walls, receives a great number of right-bank affluents. There is not, however, a single left-bank one. Between Ḳarn el-Jahûdî, the northern spur of the ʿAffâr mountain, and the ridge on which lies the town of Sûda, there extends an undulating lowland, which goes by the name of Ḥabt. Numerous streams flow through this important, lower-lying region.

On October 30th, the march was continued. At first, the route ran along the eastern flank of the range as far as the ruins of Nešeme, then turned west so that they might look down into the Ḥabt. After a long ascent, they reached the cistern a little east of Bejt Manṣur. As the way leading to Sûda on the southern side of the range seemed to double back, they had to ascend the pathless summit itself. By means of going down a steep, wall-like slope, they came eventually to ʿIšâk. In the village of Mʿâṣfîn, the usual observations were made. The settlement is placed on a vertical precipitous rock to the west. With numerous meanders, the Wâdî Ḏarḥân flows by north-westwards from here to Rehêḳe. A fine view is obtained from here of the Ǧebl Sîd. Terrace cultivation, so characteristic of Yemen, is to be seen here, stretching to the uppermost limits of the mountains.

From ʿIšâk, a comparatively good route leads away to Sûda, into Glaser marched on October 31st, accompanied by the Turkish troops. The town was absolutely deserted. The inhabitants had fled, leaving nothing behind them in their dwellings.

The following day was employed in reproducing the photographic work done en route, in astronomic and meteorologic observations, in the making of sketches and the determination of important points from the Ḥuṣn in the town. Detailed descriptions serve for the observations. The sextant was put into use for the first time as the chief instrument. A series of very important angles were measured from the terrace of the government building.

Once more, a sketch of the district was made from the ruins of Masán, which lie quite near to the N. W. of the Ḥuṣn. The town of Sûda is constructed on a ridge stretching from S. W. to N. E. North-west of the town extends a plateau, which slopes away northwards and is known as the Dulʿat Sûda. In the valleys round about here, there are many coffee plantations. They must be the best in the whole of Yemen. Besides this, there are particularly fine bananas. Grain crops are grown on the well known terrace system. The mountains as far as summit seem to be surrounded by hypsometric lines, for each terrace is set out horizontally, and separated from the one next adjoining by a stone-wall 4-6 metres high. There are no clumps of standing timber. Isolated trees only can be seen on the mountain-slopes.

On the 1st of November, Glaser was able to climb the Ğebl Šadab, on the east of the town. To the camp of Ḳumre, the going was extraordinarily difficult. The way was often entirely covered with quite smooth stone slabs, so that the greatest care had to be exercised to avoid falling into the depths below. The village of Mṣallâ and the el-Ğennâbî ruins lay on the route. As a base for measurements, Glaser chose the Ḳassaba Ḳarántel, which consists of a round tower and a small farm and which was built approximately 100 metres from the real Ḳumre on the highest part of the plateau. The several measurements of angles from this point are extremely valuable. From here, another quick excursion was made to the village of Ḥâğib on the Ğebl Sidâre and then the return to Sûda was made following the same routeway.

As an excursion to the town of Ḥamr, which lies some five hours N. E. of Sûda, was despaired of, owing to the unfriendliness of the Commandant, Glaser journied back to ʿAmrân on November 12th. The officer Jussef Effendi, who was travelling back on the same route, and for which purpose the Commandant of troops in Sûda had given him an escort of 30 men, showed himself very inconsiderate and let Glaser carry on by himself alone with his heavily burdened muleteers. Such was his rudeness that, when Glaser overtook him in Nešeme where he had made a halt, he neither greeted him, nor complied with his request to wait. Glaser rode into the Wâdî Bejt Kilâb and saw too late, that the Turkish officer with his escort had taken the route via Ṣarâre, that is to say, along the range limiting the Wâdî Bejt Kilâb to the west. So that he should not be entirely alone in the dangerous district, he had now, with his loaded muleteers, to clamber up the steep face of the Ğebl Akhûm under the greatest difficulties. On the summit, he unexpectedly met with the column of troops again. After circumventing the Wâdî Bejt Kilâb, they reached the district of Ṣarâre, which is situated on an extensive plateau. The bare rock extends to the horizon, and appears to be almost artificially cleft in square slabs. The high mountain-ridge forms the watershed between the tributaries of the Ḳâʿa el-Baun and its continuation, and those of the River Tihâma Môr. Abraḳ, already known to us, was the next aim. The el-Ḳaṣr ruins N. W. of this village were given a flying visit. As there was no place in this locality for the night's stay, the moved on despite the lateness of the hour. Then came the descent into the Wâdî Šauḳab, using the same route as that on the journey to Lômî. The village of Ḍabâʿîn was kept to the right, and Bejt el-Aḥrak district lay close to the left. The way continued on its familiar path through the Ḳâʿa el-Baun, and they arrived eventually, after a practically twelve hour ride at ʿAmrân.

The next day, the altitude of the sun was compared with exact timings, and the latitude fixed.

As the Šeiḫ of ʿAmrân, who had just gone away, was necessary to the continuation of the work Glaser decided on making an excursion to Ṣanʿâ on November 14th. He left a large part of the baggage behind. Keeping the village of Neğr to the left, they passed through the settlement of Bejt Šâjaʿ, going E. S. E. The ascent was quite gentle. Between the plain of the Baun and that of Ṣanʿâ, there is no greater mountain-range. Only a considerable number of basalt bosses interrupt the undulating tract. The black lava deposit makes the soil almost entirely useless for cultivation. At the foot of the Ğebl Ḍîn, Glaser decided to climb the mountain. This he carried out. It was explained by the natives that they met, that a pilgrimage was being made to the burial place of the famous Wâlî Kudam ibn Ḳâdîm in the locality. On the summit of the mountain, the astronomical position of the place was carefully determined. After copying down three (Himyaritic) inscriptions from the outer-side of the mosque-wall, the magnificent panorama got from the terrace of the

dwelling-house N. E. of the Mosque was used in measuring a considerable number of angles. Azimuthal determinations and a more careful description of the things seen complete the picture. A really long time was taken up with these tasks. Yet as it was exactly full-moon that day, Glaser decided to reach Ṣanʿâ on the same night. A sharp ride brought them to the village of Ḍarwân, and they carried on through el-Maʿmer to the inn of el-Azraḳein. After a short halt, the journey was resumed and with good fortune they arrived past midnight before the Bâb Šuʿûb in Ṣanʿâ.

The next day (November 16th) was devoted to the ascent of the Ǧ. Nuḳûm. In the higher parts of the mountain, the way was absolutely impassable. Only with great difficulty and a great loss of time could they gain the summit. While the position was being astronomically fixed, the assistant dropped the valuable golden chronometer on the ground, thereby breaking the glass into a thousand splinters and stopping the timepiece itself for a considerable period. As the explorer depended so much on this instrument, it is not surprising that, by his own account, he should have been so affected by the incident as to be brought near to tears. The rest of the time he occupied in measuring angles between the prominent points of the locality.

Immediately on his return to Ṣanʿâ, he set about repairing the chronometer, which he did tolerably well after a great deal of trouble. To give it a trial, he made a series of exact timings. From those, he confirmed his fear that the timepiece was not working exactly. Gradually, by means of correcting the regulator each day on a comparatively short walk, the chronometer was put into working order.

JOURNEY TO KAUKABÂN, ŠIBÂM, TAWÎLA AND ṮLÂ.

Glaser originally had the idea of making the return journey in the company of the Šeiḫ of ʿAmrân, who was present in Ṣanʿâ, by the indirect route via Kaukabân to ʿAmrân. As the latter explained however that he wished to take the direct route, Glaser decided to visit Kaukâban and Šibâm with the sole company of two zaptiehs put at his disposal and one mule-driver. They broke camp on November 25th. On riding out of

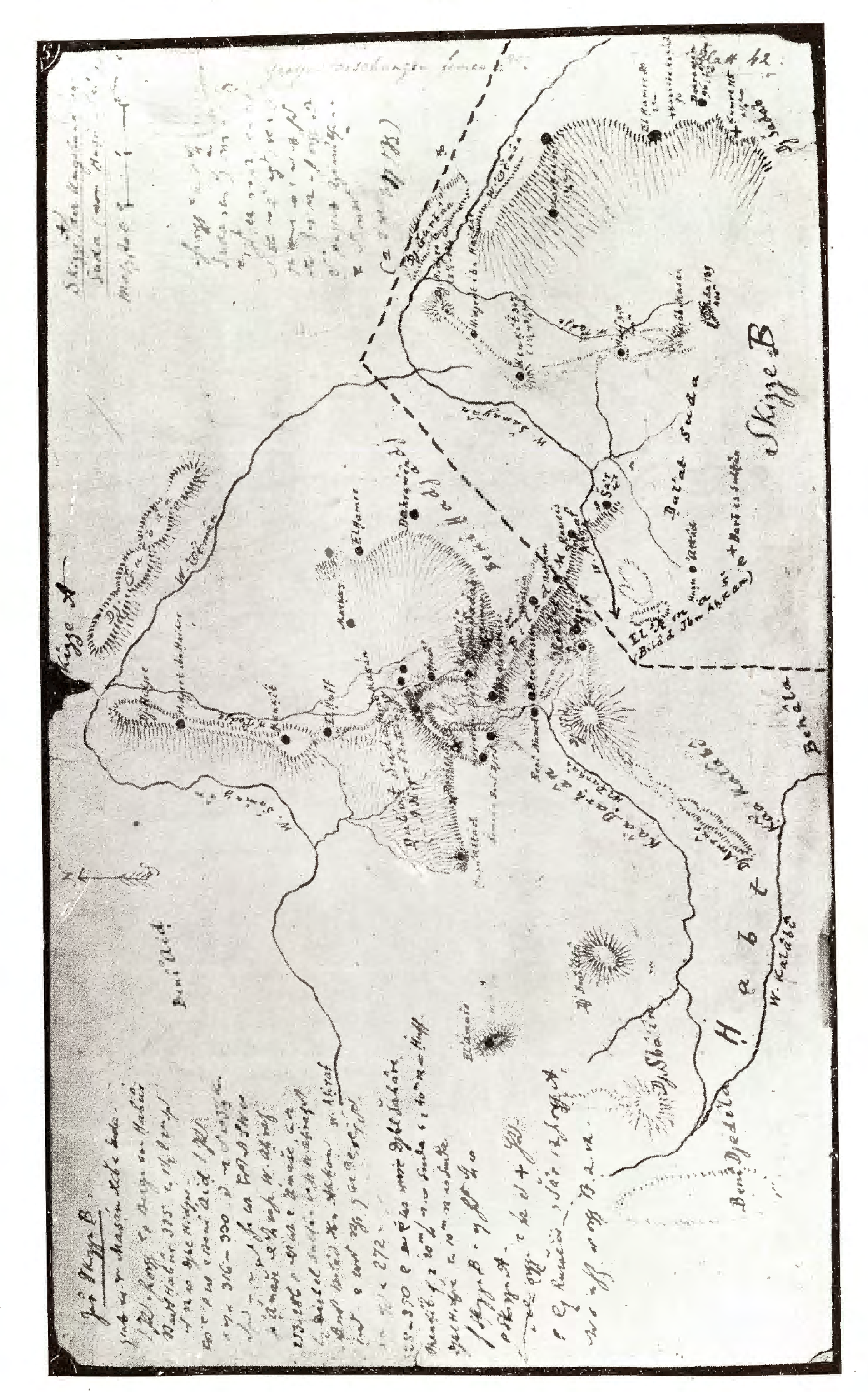
the Bab Šuʿûb, they turned left towards Ḍulâʿ, a widely scattered village with many groups of houses. A gentle incline led them thence along the east bank of the Wâdi Ḍahr. After passing a small ǵail, they arrived at the small village of Bejt Naʿam. The Wâdî Ḍahr was crossed, and after passing a second ǵail the climb led them on to the western ʿAḳabe and so across the high-level plains of the Ḳâʿa Ǵurze and the Ḳâʿa Munaḳḳeb. The mountain and village of Munaḳḳeb were kept close to the right of the route. The latter consists of a collection of black houses and huts on the western part of the eminence there. A fine cistern is situated at the southern end of the settlement. Each halting point the explorer used for reading off the instruments brought with him. From here the road turned westwards, passing only 1/2 km. to the right of the village of Ḍarhân. The northward flowing wâdî called after it, and situated to the west, was traversed. Crossing an intervening ridge, they came to the considerably deeper lying Wâdî Bâb el-Feǧrên, wich flows past the Ǧebl Ḍofîr and the Ǧebl Bâb el-Feǧrên, likewise northwards. The almost vertical rock-wall of the Ǧebl Ḍofîr is composed in its upper layer of limestone, in its lower of sandstone. The Bilâd Hamdân, stretching eastwards from this point is entirely composed of dark rock. The provinces of ʿAjal Srêḥ and Arḥab adjoining on the north also possess this characteristic. The broad plateau and the cone-like hills which interupt it are all of volcanic formation. From here, the route led through the so-called Bâb el-Feǧrên between the Ǧebl Ḍofîr and the Ǧebl el-Feǧrên. The latter has a substratum of red sandstone, overlain by masses of basalt. The village of Ḍofîr lies picturesquely at the foot of a pointed mountain-ridge jutting out into the Ḳâʿa. To the S. W. the Ǧebl Ḍofîr is connected with the Ǧebl ʿArûs on the highest part of which lies the Ḥuṣn ʿArûs. The route then led N. W. only a short distance to the right of Ḍofîr. The district of Ḥallaḳe lay, after traversing a ǵail, not far distant on the right-hand side. The same small watercourse was followed on to Šibâm. At sundown, the little caravan entered the north-east gate of the town. The comparatively large, fine town made a favourable impression upon Glaser.

As it was already late in the evening, he betook himself in the company of the mudîr of Šibâm to Kaukabân, which is situated at a high

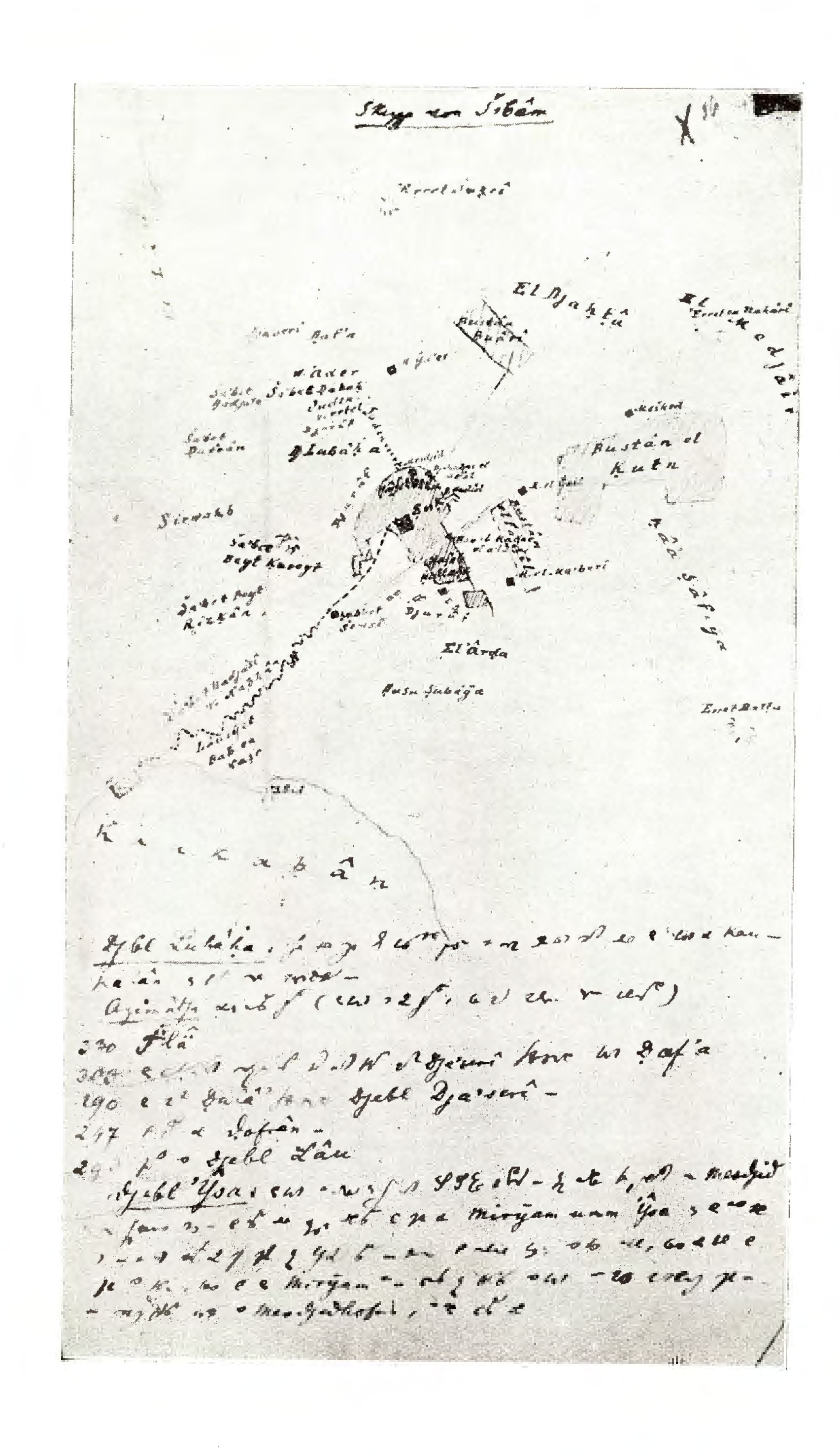
altitude. The route went on in a good, stair-like path zig-zag through the rocky ravine of the Wâdî Nabhân. At many points, the barely three metres wide gorge is bridged by artificial arches, called ʿaḳd. Entrance into the town of Kaukabân was made by the Bâb el-Ḥadîd gate, and lodgings in the form of a well furnished room were found in the beautiful semsera. In opposition to Ṣanʿâ and many other Arabic places, where all wall ornamentations have to be omitted on account of harbouring vermin, Kaukabân is very rich in this direction.

The next day (November 26th), the usual astronomical and geodetic tasks were undertaken, a traverse for the purpose of orientation was made through the town and valuable, large-scale sketches were carried out. The town lies almost at the S. E. termination of a mountain ridge running for the distance of several route-hours from S. E. to N. W., and bearing the general name of Ǧebl Ḍulâʿ. As already mentioned, the rock of Kaukabân, which falls steeply away on all sides on account of the gorge of the Wâdî Nabhân that the Wâdî Naʿîm connects on the west with the town, forms with it, though as it were separated from it, a natural entity. From the Bâb el-Ḥadîd Kaukabân extends S. E., right up to the steep, wall-like, eastern slope of the rock. At this point also, the old town appears to have standing old wall-remains. Here are found in the ground, artistically built, four-cornered holes which were used in pre-Mohammedan days as granaries. The houses are constructed from red sandstone and make, in the right light, a striking impression. The buildings of the earlier Imâmes betray themselves by their lay-out and beauty especially. For the most part, however, they are actually destroyed. Only a mosque with a tower is extant in the town. Of the three mesâǧids (prayer-houses), that near the mosque must be particularly old. The cisterns in the south of the town are really enormous and could supply a place three times as large with water. The Jewish quarter lies outside the town to the E. S. E. and is made up of low, stone houses. The population has been very backward since the breakdown of the power of the Imâmes of Kaukabân. An excursion was made especially to Šibâm situated at the foot of the mountain and to Ṣanʿâ. Glaser judged by his visit that the town was on the brink of ruin.

On November 27th, he explored the whole mountain on all sides,



J. WERDECKER, *North-West Yemen.*



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and established some geographically important facts. On the southern part of the rock-plateau are found only a few houses, then, as explained above, a series of very old and deep cisterns and moreover, two great granaries of the old town, cleverly constructed out of the extraordinarily deep holes in the rock, the two granaries being called el-Aḥmadî and el-Ǧehannem. That part of the Ǧebl Ḍulâʿ bordering the Wâdî Nabhân on the north is called Sirwahb or el-Ḥaǧala. That part of it extending to Šibâm is called Lubâḫa and carries the former ḥuṣn of the town which stretches out at its foot. Westward of the Ǧebl Kaukabân lies the Ǧebl Meḏmere. Between them flows the Wâdî Naʿîm, discharging first to the S. and then to the W. The last named mountain represents a branch of the Ǧebl Ḍulâʿ running N. W. from the gate of Kaukabân. Besides the Wâdî Nabhân there is another cleft in the rock, commencing on the east of the great Kaukabân mosque, crossing the Nabhân and running westwards of Šibâm as far as Ḍofrân. In former times this cutting must also have been used as a route. From the el-Mešîr plateau to the south of the town, they could observe the drainage pattern of the district, which was extraordinarily useful for the geographic representation of the region. Also, careful enquiries were made concerning the paths over the mountain. All these join at the Bâb el-Ḥadîd, the only city gate standing which is actually in use. It is possible however to ascend on to the plateau by way of the very steep eastern slope of the mountain, though only with extreme difficulty.

Glaser left the town at midnight, November 27th. The usual way to Šibâm was left at a point above a group of houses, known, with a mosque, as el-ʿÂrḍa. He turned right and climbed stepwise some very dangerous rocks down into the Ġail el-Ḳât situated at the lower end of the Ġail el-ʿAlî. Water was dripping from the rock everywhere, and here and there could be seen protuberances of saltpetre. The foot of the mountain was reached so soon, that Šibâm was reached without any difficulty.

The following day was fully occupied in copying out Himyaritic inscriptions from inside the town and the Jewish quarter to the N. W. of it. The houses of the latter are mostly clay-built. On the southern slope of the Ǧebl Lubâḫa are situated many of the so-called ǧurûfs, great holes

chiselled into the sandstone, which occur in groups right to the upper limits of the rock, and which were used as dwellings. Only steps that are very small and difficult of access lead along the rock-face to them. The entrance to one such dwelling has the dimensions of approximately 100 by 70 cm. The floor of the room is about one metre deeper than this entrance-door. The sizes of the individual rooms vary. The southern side of the Ǧebl Lubâḫa, on account of these ǧurûfs, makes a picturesque sight. The entire mountain looks like a vast, many-storied building with innumerable windows.

Going by the statements of the inhabitants, the town must formerly have had a very large extent. Part of the land outside must have been the former market of the town. Four gates served as exits. Old wall-works were particularly met with. The great mosque likewise appears to be very old. The square building is fashioned out of marvellously regularly hewn, black stone blocks of more than 1/2 metre long and 30 cm. broad. Beside the great mosque there are standing eight mesâǧids. The main gate of the town, like that of Kaukabân, is similarly named Bâb el-Ḥadîd. To the east of the town can be seen two red-hued hills, 'Erret el-Baṭṭa and 'Erret Šuḳrî, that must once have borne huge Himyaritic castles. The northern side of the Ǧebl el-Ḥaǧale, which lies to the S. W., contains four groups of ǧurûfs. N. and N. W. of Šibâm, there branch away from the Ǧebl Ḍulâ' the ridges of the Ǧebl Ḍofrân, the Ǧebl Ḍaf'a and the Ǧebl Ǧa'serî, which project into the plain. The Ǧebl Lâu forms the north-eastern corner-point of the Ǧebl Ḍulâ', whence start the so evenly spaced mountains.

On November 29th, Glaser once again set out for Kaukabân. On the crest-road, he turned left from the Ġail el-Wâsil, in order to visit the ruins of Ḍofrân. This route is artificial and well metalled, leading along the slope. The Ša'bet Bejt Rizḳân was reached, and the foot of the Sirwahb followed until an eastward-running wall, with a gateway through it leading to Ḍofrân, was met with. Everywhere there were beautiful gardens. To the east, the Ša'bet Ḍabâḥ borders the terrain of Ḍofrân. Between the Ša'bet Ḍabâḥ and the Ǧebl Lubâḫa stretches the Jewish quarter, as far as the northern city-wall. The wâdî north of the Ša'bet Ḍabâḥ is known as el-'Áder.

On November 30th the ruins of Bainûn and Bejt 'Izz were visited and an ascent of the Ǧebl 'Îsa attempted. The path went to the right to the Jewish village, passed the Ǧebl Ḍaf'a, and led next towards the place Ḥabâbe. At the foot of the Ǧebl Lâu and on its northernmost peak, the path turned left, crossed a low ridge lying before it, passed the Ġêl eš-Šêḫ, and in a short while arrived at the ruins. They are situated at the northern foot of the Ǧebl Bejt 'Izz. The well cultivated land around it is open only to the N. and N. E., otherwise it is ringed in by mountains. The ruins themselves are built on a moderately high rock joining the Ǧebl 'Izz on the south. At other points, the rock falls steeply away. The plain lying east of the ruins is called Ḳâ'a es-Sabawât. Several ruins are situated to the W. and N. W. on the edge of the Ḍulâ'. The positions of the various places were correctly determined by azimuth measurements. The next objective was the ruins of the village of Bejt 'Izz, which was entirely destroyed by the Turks. The way over the N. to S. running 'Aḳabet is very old and can be compared with the cleverly built road from Šibâm to Kaukabân. West of Bejt 'Izz, the south-west flowing Wâdî Ġazwân has its source. The Ǧebl 'Îsa is cut off from the actual Ǧebl Ḍulâ' by this cleft-like valley. On the eastern slope of the Ǧebl 'Îsa, the village of Batûḳa was touched, and from here the very difficult ascent of the mountain made. The peak itself was crowned with a mesǧid, where Glaser carried out the usual geographical work. The return was made by the same route to Bejt 'Izz, and from that place to Kaukabân. From here, the climb to Šibâm was immediately commenced.

On the forenoon of December 1st, the very difficult ascent of the Ǧebl Lubâḫa was accomplished. Nothing of archaeological interest was found.

In the afternoon, Glaser, accompanied by the mudîr of Šibâm and his attendant, rode to Ḥuṣn 'Arûs. A ride of an hour's duration brought them to this village. It lies on the south-side of the similarly named mountain, which joins the Ǧebl Ḍofîr, and which, like the latter as well as the Kaukabân range, is composed of strata of sandstone and limestone. East and north of it, as already explained, the black lava is found. A feature of the landscape there is the numerous knolls of volcanic origin. Particularly interesting is the Jewish cemetery to the S. S. E. of the

village, possessing some inscribed gravestones which bear witness of their great age. Climbing the rock on which the ḥuṣn is situated was very steep and dangerous. The path led frequently up a completely vertical wall, into which small cavaties were made, in order to get a better foothold. According to Glaser, the Arabs were bolder and more skilled than monkeys. He noticed wonderfully carved cisterns at various points in the rock. A villager was keeping guard over them. Such was the fine view got from the place, that the scientific work of measuring the azimuth and producing an orientation sketch was carried out. The same route was selected for the journey back to Šibâm.

Glaser's next aim was to pay a visit to Ṭawîla. The excursion to this place was commenced on Sunday, December 2nd, 1883. The ascent of the Ğebl Ḍulâʿ was made by the known route leading past the gate of Kaukabân. At first the march went W. N. W. along rising ground. The well paved path sunk gradually lower. On the left, the land falls away to the S. S. E. to the W. Liğâm and the W. Ġazwân which take their source here. Above Bejt ʿIzz to the right of the path, another gentle slope began. Close to the northern edge of the Ḍulâʿ, it passed the localities and ruins of Bejt ʿOṯmân, Rašîd and Ḥağar Zakâtî. The route from here ran, on the average, pretty well to the N. W. The Ğebl ʿÎsa remained continually on the left hand. About midday was reached the source of the southward-flowing W. Badʿa, which unites with the W. Ġazwân. Here, the route wound up to the head of the last-named wâdî to the S. W. On the wâdî's right bank, not far to the left of the route, lay the village of Nadâʿ. After a short distance to the S. S. W., the party wouud to the W., so as to strike the head of N. W. flowing W. Bukúr, which together with the W. Shêl discharges into the W. Lâʿa, and after a short climb came to a small semsera named Ṣfâ Ḳeḥlîl. The village of Bukúr lay only a short distance to the right of the route. It lies on a rock, almost completely shut in. The neighbourhood of Bukúr forms the connecting link between the Ğebl Ḍulâʿ and the actual Maṣânaʿa mountains. The great ravine of the W. Lâʿa stretches from here towards the west, where it flows into the Tihâma. The rest at the semsera was used in measuring some angles and determining some azimuths. Continuing on, the head of the W. Râs en-Naḳîl was crossed. The similarly

named village lies on its left bank. Now commenced the descent, the so-called ʿAḳabet Ṭawîle. It is long and difficult, though the way is well paved. The ridge, on which the previous part of the journey was made, sends out a much lower spur of the Ğebl Ḍulâʿ. The finish of the descent was made near the village of Direʿ, which lies a little lower to the right. From now on, the route ran along the right slope of the ridge, on the left an almost perpendicular rock-wall guarded by various kinds of cactus, on the right the magnificent and deep-lying W. Lâʿa, into which numerous rivulets flow. On this occasion, as often before, Glaser was able to observe the phenomenon of the warm current of air creeping, in the first hour of the afternoon, across the Tihâma up the mountain-side, its content of water-vapour condensing on account of the lower temperature met with, and obscuring all the views. Deposition takes place in the upper parts. After about two hours duration, the phenomenon disappears, and the whole country lies once more visible before the eyes. On a calm day, this phenomenon can be observed everywhere in the mountains lying east of the Tihâma. After continuing to march along a perpendicular wall which forms the northern edge of the range which limits the W. Lâʿa on the south, it was left about 4 p. m., the ridge, on the south side of which Ṭawîla is situated, was crossed, and the little town soon reached. Lodgings were found in the government building. Ṭawîla was formerly a simple village, and first attained to importance through the residence of a ḳaimaḳâm. In the north of the region there is a chain of four rocks, left standing as the result of denudation, and forming the remains of an actual range, which has already been discussed.

Immediately after his arrival, Glaser went on to the neighbouring Mesğid eẓ-Ẓâhir, S. S. W. of the town. Close to the right of it is situated a semsera, made from the material of the mesğid ruins. The paved way to the town was a sure sign of the great age of the ruins.

The next day, an excursion was made to Mizdid and the ruins of el-Ğirejre. No closer account was given of the route. In the whole of the recent ruins, not a single inscription could be found. The only profit was the azimuths of several points. From them one learns the names of the neighbouring villages. In the eastern part of the region, the W. ʿArâwer flows to the south to join the W. Naʿwân.

On the same day, Glaser mounted the second (reckoned from the east) of the rocks named above, which is designated the ḥuṣn. It is almost inaccessible. The hazardous enterprise was repaid by the angles measured from the summit. The little town, which is not without walls, is only made noteworthy by its fairly large market-place.

Departure took place on December 4th. The return was exactly like the outward journey. At the end of five hours, Glaser was able to salute the leaning minaret of the great mosque of Sibâm. In the afternoon, an excursion was made to the hills of ʿErret Baṭṭa and ʿErret Šuḳrî. The plain around Bejt ʿÎsa and Ḥállaḳe is commanded by them. Further, the city gardens watered by the Ġail ʿAwwâr were visited. In the evening Glaser resolved to depart the next day for ʿAmrân via Ṯlâ and Ḥaḍûr eš-Šêḫ, since the work in Šibâm and Kaukabân had been finished and worthy results had been achieved.

The journey to Ṯlâ took place therefore on December 5th. Entirely flat land was travelled through, passing east of the ʿErret Baṭṭa. From the village of eṣ-Ṣurb commenced a gentler slope, lasting to the entrance of the town of Ṯlâ. It was reached after approximately two hours. The range shows a much ravined character. Quarters for lodging were found in a semsera in the south-western part of the town. Ṯlâ is, according to Glaser, the most beautiful and largest city of Yemen after Ṣanʿâ. According to the estimate of Glaser, the size must ammount to at least twice that of Šibâm. Its appearance gives an impression of modernity. The houses are constructed from very regularly hewn blocks of yellowish-red stone. The houses are mostly very tall and the streets correspondingly narrow. The similarity of building stretches throughout the region. Its western border touches the Ḥuṣn sandstone-rock. Here also begins the wall which formerly surrounded the entire town. The ascent of the Ḥuṣn was at first declared to be impossible, as the archway over a deep cleft had been broken. With the help of some good climbers among the inhabitants and a strong rope, the hazardous enterprise, after the promise of reward, was carried through. The impression given by the ruins of the Ḥuṣn on the summit was one of age and veneration. A mosque and dwelling-house with tower must at one time have stood here. Further, there are here several more cisterns, and about twenty

of the so-called madâfins, or granaries. They are cone-shaped and made out of sandstone, their points, which bear the openings, coming flush with the surface. They are mostly 6-7 metres deep, with a base-width of about four metres, and that of the opening one metre across. As on the Ǧebl Lubâḫa, there are here also on all sides of the summit, dwelling places cut deeply into the sandstone and possessing doors, windows and niches, the familiar ǧurûfs. They appear to be a great antiquity. Unfortunately, nothing in the way of inscriptions could be found. Of particular importance were the many measurements of angles that could be made from here on account of the wide view affording so many points.

On December 6th, Glaser decided to climb the mighty Ǧ. Ḥaḍûr eš-Šêḫ, which stretches towards the W. The town was left by the Bâb Mâjaḥ gate. He rode along the range stretching westward from Ṯlâ to the village of Ḥaḍûr eš-Šêḫ, from which place the actual climb took place. He went along the right bank of the W. Ménsib. On the range bordering the wâdî to the north, the villages of el-ʿAin, el-Karâḍîn and Bejt Réjaš were seen. The Ṯlâ range possesses three peaks, that in the middle being known as Ḥuṣn en-Nâṣire. From here the route led between the two villages of el-Mahâlî and Šahîm. At the first the W. Ménsib takes its source. From the second flows the Wâdî Šhîm, whichs unites with the Ḥabâbe. A further climb left the village of ed-Derb lying above on the right. Curving across the upper part of the S. flowing W. Ḳumâme, past the village of el-Ḳumâme, the road struck out towards the district of Ḥaḍûr eš-Šêḫ. Thence, the climb was very easy. A widespread view was obtained to S. and E. from the summit. Glaser's first task here, was to measure the angles between the important objects with his sextant. No observations could be made on the west, owing to the fact that the massive group of the Ǧebl Maṣânaʿa obscures the lower-lying mountains. This circumstance was an unfortunate one for the construction of the map, since there is almost no geodetic connection between those regions visited later in the W. and those already visited in the E. The time still remaining out of the short halt, Glaser used in a description of the neighbourhood.

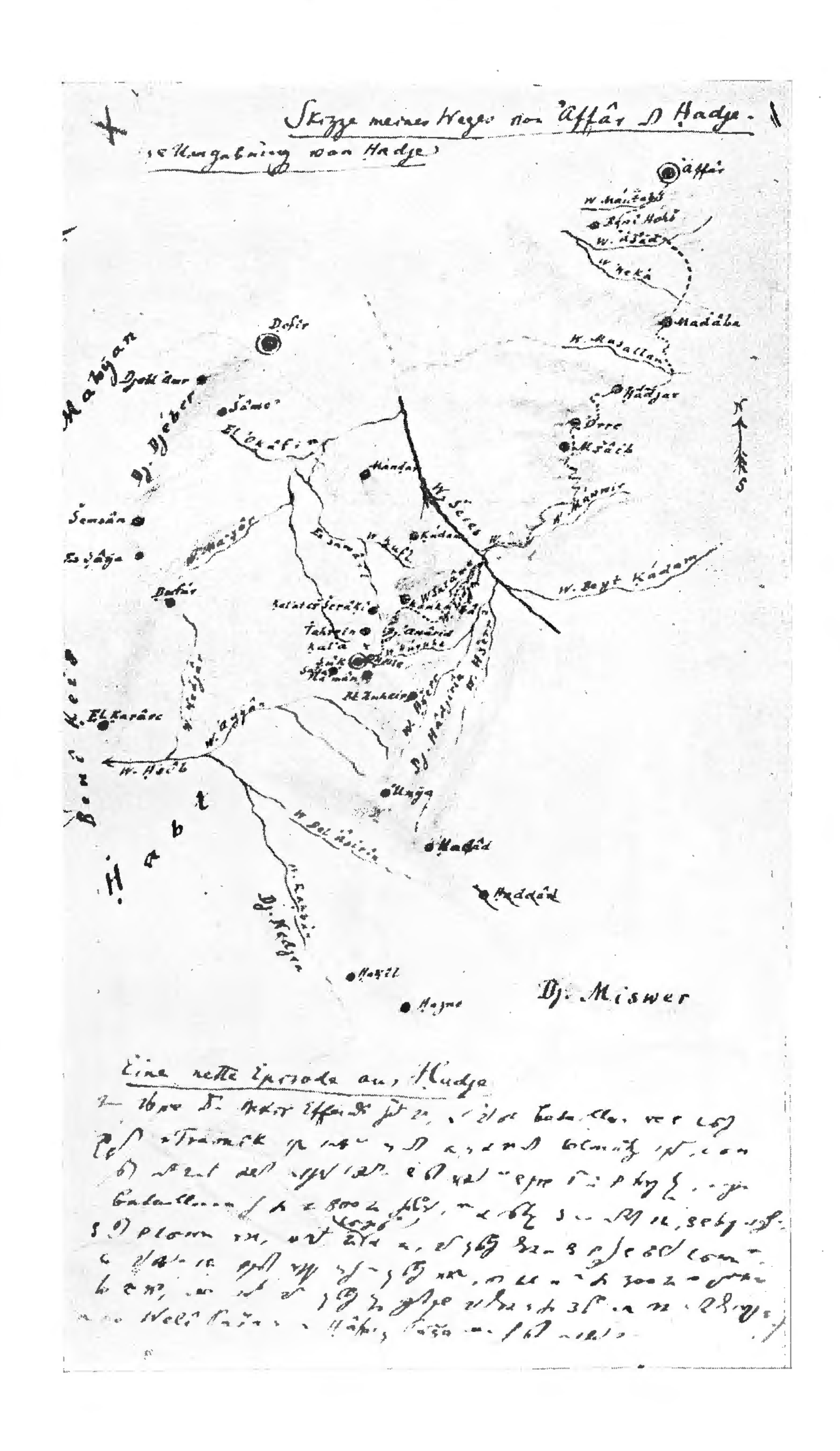
This great peak is, like the mountains of Ṯlâ, Kaukabân, Ḥuṣn ʿArûs

and Ḍôfîr, composed in its lower stratum of sandstone, and its upper of limestone. There stretches at almost the same height across a wide plateau towards the west, a much-ravined sandstone ridge, joining in the W. and N. W., and carrying the name of el-Maṣâna'a. It forms the distributing point of the drainage pattern. To the N. and N. E. join desolate plateaus, overlooking the Ǧebl Jezîd. This range is already known to us from the halt made in Lômî and Ḥalḥale. From their centre, radiates westwards a spur, forming the Ǧebl Miswer. With their continuations, the Ḍulâ' range makes a junction. The most extensive is the range, on the south side of which Ṭawîla is situated. Like Ḍulâ', it is frequently noted by Glaser. Its general direction is the same as that of the Ǧebl Miswer. Between the two is the broad valley of the W. Lâ'a, into which numerous rivulets flow. The drainage of the region between the Ǧ. Miswer and the G. Jezîd is directed into the W. Maur. The wâdîs Šéres, Bejt Kilâb and Šamîm belong to this system. All streams which turn east from the Ǧ. 'Ajâl Jezîd, the Ǧ. el-Maṣâna'a and the Ǧ. Ḍulâ', are tributary to the wide Ḳâ'a el-Baun valley and its continuation, the Ḳâ'a Ḥais.

After finishing his work on the mountain, the explorer made a swift descent into the village of Ḥaḍûr eš-Šêḫ, where the šeiḫ invited him to the midday meal. Of the natives of the place, Glaser received the highest impression. He found nothing of their notorious malice and deceit. In his opinion, these traits had always been displayed to the Turks, because they brought them heavy taxes, destroyed their proud mountain fortresses and scorned their faith and their native customs. Avarice, the most characteristic fault of the Turks, led them to exploit the subjected Arabic population to trickery and ferocity. It is easily understandable therefore that the Arabs joined together violently and were continually trying to cause their overlords harm.

After 1 1/2 hours ride on the same route as the homeward-journey, Ṯlâ was reached. Glaser arranged immediately here to depart for 'Amrân, as he expected to make no more scientific discoveries in Ṯlâ and neighbourhood. First came the descent into the W. Ḍajân. The similarly named village lay to the right of the route on an isolated mountain. The march continued into the bottom of the wâdî. Right, high above

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on a mountain, could be seen the village of ʿÛlî, left, Bejt Sinâḥ. Later the route contracts and low rocks border the road on both sides. The right bank of the waterless wâdî was gained by crossing a bridge. A general direction of north was maintained despite the numerous local windings, and finally the village of Neǧr was reached. The valley widened more and more and after a short distance through the Ḳâʿa el-Baun, ʿAmrân was arrived at, in which place quarters were found in a semsera outside the town.

The next day, the usual geographic and astronomical observations were made near the semsera and from the terrace of the government buildings. A careful survey was made of the Ḳaṣr in the southern part of the town. It was completely destroyed by the Turks. The remains of the wall built of massive blocks of stone gives a clear idea of the former greatness of the fortress. Besides the measurement of angles, the calculation of the dimensions of the mountain which closes in the Ḳâʿa el-Baun has proved of great value to the cartographic representation. A naming has been avoided at this point, as the place-names can be better seen on the map.

On December 10th, Glaser, in the company of the Šeiḫ ʿAbdallah Sâr, made an excursion to Neǧr. The place was arrived at after an easy climb. The village is situated on an almost completely isolated eminence of dark, volcanic rock. The extremely lovely spring, which is unusually deep and which must extend down to the depth of the base-level of the eminence, was next visited. Nothing of antiquity was found. Then, Glaser mounted the terrace of the tallest house to measure angles and azimuths, and to make corresponding observations for a description of the Baun. From arabs met with, he once more obtained the names of the mountain enclosing the Ḳâʿa el-Baun and the villages lying therein. Further, he was able to secure most of the names of the wâdîs flowing into the Baun, as well as their place of origin and course.

On December 11th, an outing was made to the ruins of Medînet eṣ-Ṣallît, Baḍʿa and el-Ḳaṣr on the Ǧebl Ǧennât. He left by the Bâb eš-Šerḳî with five attendants. In an hour the party reached the eṣ-Ṣallît ruins, situated on a small hill overlain by lava and limestone fragments. Apart from this, there are no places to be found in the middle of the

valley-plain. They are all on the margin of the valley, or built on the spurs which jut out into the Ḳâʿa. After a brief stop, the party marched through well cultivated fields to the genuine Himyaritic Baḏʿa ruins. These are placed on a rock which really belongs to the range on the N. W., but which is now entirely disconnected with it. Really striking was the regularity of the hewn blocks of stone used in the construction of the square tower on the south side of the eminence. The next objective was the village of el-Ḳaṣr el-Ğennât. The Ḳaṣr ʿAlî ibn Ḥamze and Medînet el-Kuffâr ruins, standing on the Ğebl Mâdir to the north-west of the district, were visited, and then the return started upon. A number of azimuthal calculations were made at all three halting-points.

Glaser set out before dawn on December 13th on the route to Ḥâz. In comparatively great cold, he passed by Neğr, on through the village of el-ʿAmrî and the district of Kurbât to Bejt Ġufr which stands on a mountain. After about four hours, Ḥâz was reached. The whole of the slow ascent was upon basalt rock. An important contribution to archaeology was obtained, as the foundation-walls are of Himyaritic origin. The natives, who were of an objectionable type, hindered his work at every point. The usual measurements were made from the terrace of a house belonging to the šeiḫ, built to the north-east on the outerside of the wall. Of all the old buildings, the Ḳaṣr has been partly preserved, being constructed of great hewn blocks of black rock. Judging from the many inscribed stones, Ḥâz must be very old. These stones were used for building the walls of the houses, which were made as high as possible as a protection for the inhabitants against snakes.

In the afternoon of the following day the district of Bejt Ġufr was visited. The ʿErrân ruins were only a short distance from the route, and a survey was made there. There is a massive pile of ruins situated on the south side of two interconnecting hills. Although blocks of stone were carried away, those which remain indicate the existence here of a real Himyaritic building. The actual village of Bejt Ġufr lies on a volcanic hill. The natives, as everywhere in Hamdân, were very unfriendly.

The next night was spent in Ḥâz, and on the morning after the return to ʿAmrân commenced. After stopping for an hour in dangerous Bejt Ġufr, the explorer marched on through ʿAmmed, which lies on the

right bank of a wâdî rising at Bejt Ġufr, and the little village Ḥiğle of el-Kurbât. The šeiḫ of this place met the explorer in a friendly manner. Finally, at noon, he set out for ʿAmrî, arriving there by an easy and satisfactory route via Neğr.

On December 16th, the powerful Ḥâšid-Šeiḫ, ʿAli Muṯannî el-Kudeimî of ʿAraḳe, arrived in ʿAmran with a large company. Glaser used this opportunity, as before, to express his wish of obtaining permission to visit his lands. After several days, the negotiations took on a definite shape. The šeiḫ wished to show himself appreciative, as Glaser had successfully doctored a wounded foot for him. The ʿOkḳâls of Nâʿaṭ had received a letter inviting them to a conference at ʿAmrân. For the first time, Glaser was able to learn from the šeiḫ the true position of the town of Nâʿaṭ. Previously he had believed it to be much farther north. He determined the exact angle between Ġebl Ḏîn and that town. Likewise, exact information concerning the position of Ẓafâr was obtained. In the discussions, the fierce opposition between the individual tribes and the insubordination towards the ruling Turks were most clearly expressed. The authorities in ʿAmrân warned Glaser of the dangers that might be attendant upon a journey to Ḥâšid. There was no mention of the very slight submission of this great land to the Turkish power. In order to keep on somewhat more friendly terms, the distinguished šeiḫ had paid a monthly salary.

As the ʿOkḳâls of Nâʿaṭ would arrive the next day, Glaser decided to make an excursion into the region of the ʿAjâlî Sorêḥ. On December 21st, with a small company, he went to the little village of Wérrik. It consists of some houses and storehouses built of black rock. A market held here every Monday by the people of ʿAmrân, had been stopped on account of defiance. The farming people used to buy in all their purchases for the week and come together to hold discussions. The šeiḫ of the place made no friendly overtures to the explorer and only after many exhortations allowed two of his men to accompany him on further expeditions. From Wérrik the route went to the right of the Ṣallît ruins, with the Ḥâšid villages and fields on the left. Rêde was not reached directly. The route turned firstly towards the N., and the town was achieved after rather more than three hours fatiguing march.

He put up with a so-called muḳahwî, or lodging-house keeper. These inn-people are usually called muzejjin, and are barbers, simple folk of humble origin, who will however enter into no despised calling. Most of the town lies on the Ǧebl Ṣalîl, which is separated from the Ḳâʿa el-Baun by the Ḳâʿa Ḥámuda. From the higher part of the place, a view is obtained over the Baun almost as far as ʿAmrân, and over the whole of the Ḳâʿa Ḥámuda, too. On the range closing in the west side, can be seen the well-known villages of Lômî and Daʿân. Details were easily secured here of the property ownership of the leading tribes in the adjacent territory.

Further, from this point, a very fine idea can be got of how the Baun forms the divide between the massive, white or yellow limestone range to the W., which stretches far out into the Ḥâšid country from Kaukabân, and the volcanic rocks to the E., found especially in the Arḥab country. The white rock stretches out from Wérrik almost to Nâʿaṭ, in the form of a range running eastward by the villages of Bejt eḍ-Ḍulʿî and Ḳuhâl. As the two types of formation do not intermingle, the impression received from a distance is that the sun is shining on one part, while the other is overshadowed by cloud. This is particularly the case near Nâʿaṭ. The Ǧebl Ṭanên, on the southern part of which stands Nâʿaṭ, is white, while all the other mountains appear sombre-hued. Only the Baun consists of light alluvial sand. Only east of Rêde and in the northern part of the Ḳâʿa Ḥais, which forms the continuation, does the broad valley-floor appear to be overlain by a low lava deposit. The ruins of the old town, known as the Medînet Tulḳum, are situated mostly to the E. and N.E., draw very closely into the foot of the mountain and take up a large space. All the old inscribed stones had long since been carried away by the Arabs to the neighbouring villages, where they were put at the top of the walls of the houses to serve as talismans against the evil spirits. The ruins of a fortress, called Ḥuṣn Ḳaus, lie on the slope north of the actual village. Glaser did not miss fixing from the higher part of it the direction of the important objects, by means of the usual measurement of angles. The position of Nâʿaṭ was even more accurately determined than it had been before.

As the longer journey to Ǧûle could not be undertaken on account of the attitude of the villagers, Glaser decided to return. Wérrik was once more visited on the backward route. From that place, he made eastwards to Benî Zubeir, in order to pay a visit to the ruins of Ǧebl Zaḥzaḥ. A slow ascent led along the right bank of a wâdî, whence the route rounded the head of a second, which flows into Bejt eḍ-Ḍulʿî, passing finally along the right bank of the Wâdî Ḥanîa, which rises north of Benî Zubeir and flows finally into the Baun at the village of Ḳuhâl. The last mentioned wâdîs are eroded in light-coloured rock. A forced march brought him in barely half an hour to the Ǧebl Zaḥzaḥ, so that the mountain might be crossed before sun-down. The ruins of the Ḳaṣr were next to be visited. They are situated on a small hill between the Ḳâʿa Mérmel and the Wâdî ʿOḍḍa, and consist of a great pile of ruins which draw attention by reason of the very beautiful, hewn blocks of black stone. Here also were the inscribed stones carried away into the adjacent region. The actual fortress stands on the south of the little hill. The explorer unexpectedly hit on the remains of the foundation-walls. There are some well preserved cisterns. The rest of the time was occupied with the accomplishment of a sketch and azimuthal measurements. Quarters for the night were found in Benî Zubeir only after long negotiations. When the natives saw that the supposed Turks meant them no harm, they sought to correct their error, and almost all the men of the village came in the evening to visit. On closer acquaintance, the simple peasants with their peculiar views and customs made a really good impression.

On December 23rd, the expedition to Rûʿ was made, after an early morning task was carried out, namely measuring a number of angles. The search after inscriptions had very little result. A ride of more than an hour brought the expedition to the quite tiny village. The ruins of the Ḳaṣr, which consist of three parts, are situated on a low range stretching in a semicircle eastwards from its commencement on the north. The Wâdî Rûʿ, rising to the east of the modern village, enters the Baun at Neǧr. The Ṣanʿâ-ʿAmrân route has part of its way along its right bank. The middle ruins possess well preserved cisterns; the eastern appear to have been the most extensive of the former town. After completing the geographical tasks, the explorer rode down the left bank of the W. Rûʿ,

finally meeting the Ṣanʿâ route on its right side and reaching ʿAmrân by the Bâb Šerkî after somewhat more than two hours.

On the 24th of December, Glaser received the expected ʿOḳḳals of Nâʿaṭ. But he had to give up his plan because he did not get the Wâlîs permission.

JOURNEY TO KOḤLÂN, ʿAFFÂR, ḤAǦE, ḌOFÎR AND THE ǦEBL MISWER.

Next day (December 25th), the Šeiḫ ʿAbdallâh Ṣâr of ʿAmrân announced that he had to go to Koḥlân on official business. The explorer naturally used this unforeseen opportunity to explore this great region lying to the W.

He departed from ʿAmrân at 9 a.m. sharp, on December 26th, by the Bâb el-Aʿlâ. By way of Bejt Bâdî, the route led into the country of the Ḍarhânî Šeiḫ. A short rest was enjoyed at the el-Aḥṭûb cistern, S. W. of the village. On the right is the Wâdî ʿAjâl Ḥâtim which enters the Baun. The end of the latter was reached after a short time, and the village community of el-Ḳâʿa, containg but a few houses, was entered. The route went on between it and the so-called Ḥuṣn Ḳâʿa, a quite modern building. From el-Ḳâʿa flows the W. Hiǧre after coming from the high Ǧebl Zâfin; the wâdî contains the villages of Ḥâǧib and Hiǧre. On the S. it is limited by the extensive Ǧebl Baḥš. The little caravan ascended the range north of the wâdî, and then followed along the northern slope so that the aforementioned wâdî could no longer be seen, being replaced by the Wâdî ʿAjâl Ḥâtim, which flows down from the high Ṯuluṯ plateau to the N. W. After reaching the altitude of the village of el-Ašḳâḳ, lying approximately 1/2 km. to the left of the route (high above), the explorer carried straight on to the view-point from which the high-up village of el-Ḳâbile was visible, standing on the range that has the Wâdî ʿAjâl Ḥâtim on its left. The party kept on through several villages on the aforementioned ridge as far as Bejt Bâdî. About noon, they reached Ḳârin. A stop was made at a coffee house, S. W. of the actual village. From the unfavourable view-point, only a few of the angles of the more distant objects could be measured. The village consists of several sections, the most im-

portant one being enclosed by a wall. A wâdî flows east from Ḳârin, joining the W. ʿAjâl Ḥâtim at Bejt eḍ-Ḍarḥânî. After an hour the journey was continued. The ridge forming part of the Ǧebl Zâfin was now climbed. The direction of the route was W. N. W. Passing between the two villages, Ḳirjet el-Ešmûr and ʿErret el-Ešmûr, the party visited the Durûb eṣ-Ṣfâ ruins. The place of Zâfin lay some 2 1/2 km. left of the way. Between Zâfin and Ḳirjet el-Ešmûr there is a ravine in the rocks carrying the name of Feǧ el-Ešmûr, and forming part of the W. Šéres system. As often remarked before, this region consists of light-coloured, stratified rock. The view here was unfortunately completely obscured by the Tihâma fog-bank, which was just rising. On the plateau, they passed the Ḫarâb Šemr ruins that appear once to have been a large village with a fine cistern near it. Durûb eṣ-Ṣfâ was reached after two tiny wâdîs had been passed over. Near Ešmûr these two unite with the Feǧ, flowing then into the Šéres. The ruins stand at the edge of a very steep cliff overlooking the W. Ḥabarân which flows into the W. Maur. An exact idea of the northern regions could not be got, as the mist had turned into rain. So much was gathered, however that from here they traversed quite a small ridge forming the watershed between the W. Ḥabarân and the W. Benî ʿAšab, a tributary of the Šéres. The W. Benî ʿAšab, rises at the larger village of Ḥalamlam el-Aʿlâ. Little wâdîs flow into it from the aforementioned range. One comes from the Ḫarâb ʿIzzân ruins, situated at its head and looking down into the unusually deep W. Ḥabarân. They are passed by the route. From them, the mountain-range receives the general name of Ḳaṭʿat ʿIzzân. From the village of Bejt el-Walî began the descent, by means of atrocious paths. Many times the muleteam was scarcely able to pass between the blocks of stone with the burdens. The climb led approximately half-way down the slope of the W. Ḥabarân. They came then to a mountain, cut off from the Ḳaṭʿat ʿIzzân but actually forming its continuation, carrying the town of Koḥlân. They got to the town at 5 p.m. The explorer put up at the Šeiḫ's house, which made a good inn.

On the morning of December 27th, the Ḥuṣn was surmounted, using the panorama so obtained in a calculation of longitude and the measurement of the usual angles. A general idea was also obtained of the

lay-out of the drainage-system. The town of Koḥlân extends along the N. and N. E. sides of the mountain, which falls away very steeply into the W. Ḥabarân. The houses towering one above the other present a picturesque appearance. It appears small, unless seen from the N. and N. E., a magnificent sight as then its whole extent is visible. From the other side of the Ḥuṣn only a few houses are to be seen. The town possesses no old remains. Its occupation, like that of the surrounding region, is that of coffee cultivation. This is particularly the case wherever there is flowing water. The floor and lower slopes of the valley are the favoured land. Thus ground between 1700 and 1900 metres is especially utilised. It prospers exceedingly on the heights, too, just as on the Ǧebl Ǧeber in the Bilâd ibn-Šemsân. N. W. of Ḥaǧe, again, it flourishes at a height of 2000 metres. Optimum growth necessitates even temperature conditions. It cannot stand a big diurnal range. This is the case in those valleys subject to the Tihâma fogs. Coffee growing is impossible on the E. side of the Serât because of the big diurnal range there. Harvesting is carried on between December and February. Commerce with Ḥodeida and other coastal towns is maintained chiefly by the Ḥaǧe merchants who have big coffee markets in the actual valleys.

The explorer left for ʿAffâr the same day, by the same narrow gate as used on entering. A very steep descent led down to the Sûḳ lying far below, which is used as the town market. The route was resumed after half an hour. A breakneck path along a rock-face led to the village of Ḥimeʿ. They quit the steep eastern bank here, climbing to a market place of miserable huts, which was yet extensive situated in a little wâdî. The stream has a short course before joining the Šéres. From here the eastern bank had once more to be surmounted. After passing the ravines between Menḳîf and ʿAffâr, the route turned right to climb the mountain of ʿAffâr. The place has two parts : the so-called ʿAraḳe with the ghetto at a medium altitude on the eastern side of the mountain, and the Ḥuṣn which is built high-up on the rock and can only be reached after much exertion by a very bad path. The western slope of the mountain is, however, climbable. The fortress is quite large, lying on a S. E.-N. W. running rock. It drops some 100 metres on the S. E. The actual Ḥuṣn occupies the outermost of the S. E. rocks. A beautiful mosque

has been built on a small spur to the W. In the northern section, there are dwelling places for about twenty families. There is no doubt some agriculture carried on there. The commander of the Turkish garrison treated Glaser with great friendliness. He got on well with the explorer as he was a well-educated person. In the evening he observed the pole-star to fix the latitude of the place, and next morning carried out a calculation of the longitude. Furthermore, he climbed up to the Ḥuṣn to carry out geodetic work. Favourable stopping points and views were used to obtain an idea of the neighbourhood. The soldier's camp lay some 20 metres below on a terrace-like ledge on the mountain-side.

On December 29th, the explorer departed for Ḥaǧe. The Turkish captain was kind enough to place at his disposal some soldiers to help in the difficult descent from the Ḥuṣn. They first climbed down into the Wâdî Mauṭab, then up the left bank past the village of Benî Hohš into the Wâdî Asʿad. The path being closed in on both sides by stone-walls, the muleteam with its bulky baggage was unable to get through, and the men were forced to go along the mountain-side, avoiding sudden crashes into the depths below only with tremendous effort. To make up for the time lost, while they scrambled along the mountain-side, Glaser took the opportunity to observe the vegetation and ascertain the names of the chief trees and shrubs. When they reached the head of the Wâdî Neḳʿa, which joins the W. Asʿad, they came to the village of Maḏâba. The last two wâdîs are part of the W. Ṭaʿlân system. Next there followed the W. Msállam, a tributary of the Šéres. The first coffee plantations seen were those near the village of Ḥaǧar, being barren in the deeper valleys. East of this place exists a cactus-thicket. Shortly after passing the villages of el-ʿOrre and Mšâib, the W. Šéres was seen. An extra steep path led to it; the muleteam with its heavy burden was obliged to keep leaping down, metres at a time. After a short distance, the W. Máwir, a tributary of the main valley, led to its confluence with the W. Šéres. This point is exactly north-east of Ḥaǧe. The lowest part of the W. Máwir goes by the name of W. Sağ. The ḍahja-thorn, a wild plant, occupies many places on the mountain-side, making it very hard for the burdened mules. Coffee plantations were seen only where water

could be easily obtained from the Wâdî, on carefully laid-out terraces. There was a huge number of apes which fled at the approach of the travellers. Not liking their proximity, they pelted them with stones Their habitat seems to coincide with the Tihâma fogs.

A small tributary stream of the main wâdî was used for watering the mules. The valley is up to 200 metres wide, and supports an unusually luxuriant vegetation. The chief kind of grain crop here is a type of maize called rûmî. It is noteworthy that barley does not prosper here, and that it has to be bought at prices considerably higher than those ruling in regions farther east. The slopes are overgrown with innumerable wild trees and shrubs. A large part, however, supports carefully tended coffee bushes. The whole of the W. Šéres forms what might be termed an individual coffee plantation on its own. The warm climate, with minimum temperatures never falling below 10°C., the damp Tihâma mists, and the almost continual availability of water, form the main reasons for its flourishing cultivation. The berries are picked as soon as they turn red, then they are dried and disposed of in the great Sunday market held in the Šéres district. This market lay above on the left after a further march. Although the commandant of ʿAffâr had advised them not to halt long in the wâdîs which were hostile to the Turks, a stop was made at the confluence of the two wâdîs, Salâme and Liǧâm, from the S. W. The Arabs at work in the coffee groves did not object or cause any trouble. Meteorological observations here gave a moderately high temperature reading (27.2°C. at 2 p. m.). Despite this, owing to the high relative humidity of the atmosphere, the heat was more oppressive than on the dry plateaus, where rapid evaporation permits the body to bear higher temperatures.

The ascent to Ḥaǧe being exceedingly steep, it has been improved by the Turks, so that even heavily laden camels and mules may use it. Finally, the route led up onto the range where it gave a frequent view of the larger W. Húrube. At the head of the W. Salâme, a cistern was reached. Opposite the massive Kaukabân Ḥaǧe rock rears up. The summit was soon achieved, and the whole extent of Ḥaǧe could now be seen. The Ǧebl ʿAwârid on the W. was crossed by well marked paths, and after following the left bank of the W. es-Sawâil, in which coffee

plantations were again seen, Ḥaǧe was finally entered by the quarter known as Ḥille, wherein reside most of the Jews. Into the Sûḳ of Ḥaǧe, Glaser received a very warm welcome. Nearly all the Turkish officials responded to his greetings.

As the Ḳaimaḳâm (highest administrative official) of Ḥaǧe had gone away owing to an insurrection S. of the town, and he did not wish to attempt anything greater, in view of the dangerous conditions, without consent and assistance, he decided to occupy the Sunday (December 30th) in fixing the position of Ḥaǧe and its neighbourhood. He mounted the so-called ḳalʿa and took astronomical and topographic observations from its tower. These estimations were illustrated and completed by a small sketch.

An excursion void of results was made next day from the town to Kaukabân in the N. E., a place with which we are already familiar. During it, rocks like those of Kaukabân Šibâm were observed, bearing modern ruins only.

The town of Ḥaǧe is very extensive, combining several districts. The ḳalʿa or citadel stands on the highest N. E. part of the Ǧ. Ḥṣwîn. The Sûḳ of Ḥaǧe is situated S. S. W. of the ḳalʿa, resting against the rocks of the Ǧ. Ḥṣwîn. It forms the largest section of the town, consisting almost entirely of low storehouses and being enclosed by a wall. To the S. W., lying far below is the Ṣaʿṣa. The village Naʿmân stretches on a hill southwards. To the S. E., at the foot of the ḳalʿa, are the houses of the ghetto, Ḥille. Finally, close by to the north, is the Ẓahrein cemetery. The town made quite a big impression on Glaser. The Turks kept it comparatively clean. They had constructed some fine barracks and a hospital. From the mountain-knot on which Ḥaǧe stands wâdîs flow away on all sides, while the district is unusually entrenched by valleys. From the botanist's point of view, it is an interesting fact that there should be so many ricinus bushes growing near the town.

On New Year's Day, 1884, Glaser undertook an expedition from Ḥaǧe to Ḍofîr. In order to carry out geographical calculations, he departed early, arriving at Ḍofîr before noon. A more direct route to Ḍofîr does not exist. He had to follow the ridge which stretches in a flat curve from Ḥaǧe to Ḍofîr. Awful paths led down a steep slope into a

ravine, only to regain the crest of the ridge a little while later. The route was as follows. The explorer rode W. past the Sûḳ and north to Ṣaʿṣa, which extends along the low Ǧebl Maḥraṭ. Between them to the S. W., lay a wâdî tributary to the W. Ḥsêb. The route led straight up and down to the castle of Ḍufúr. On one side, small wâdîs flow down into the Šéres system of wâdîs, on the other, into the Ḥsêb. Ḍufúr itself lies high above on the left. The way led through magnificent coffee plantations. The young trees here reached a height of 5 to 8 metres, while a section across the stem of one of them measured 6 cm. The red fruits had already been gathered. After passing just beneath the village of Šemsân, the travellers surmounted the range, reaching the crest at the place of Šaurîja. Finally, after leaving the village of Ǧebl ʿAmr, in three hours and a half they reached Ḍofîr itself, where the people were very friendly.

The first thing that Glaser did there was to determine his latitude. Although the Tihâma clouds were beginning to come up, Glaser was able to complete his task. He had a satisfying lunch, which included honey. Then, he climbed up to the Ḥuṣn tower, to read off points afforded by the view with sextant and compass. He also made use of his crayons. The town of Ḍofîr forms the centre of an administrative district. It appears to be large, has an extensive market place and is renowned throughout Yemen for its learning. Arabic students from all parts come to study here at one of the centres of Yemenitic knowledge. Only Ṣanʿâ can compete with it in this capacity. Glaser was, however, unable to meet any of these intellectuals. They were very timid as they imagined themselves to be regarded by the Turks as rebels. The Imâm of the time, Šaraf ed-Dîn, leading antagonist of the Turks, had for a long time been living in Ḍofîr, and it was incumbent upon the learned men there to bring him into union.

As there was to be the next day an ascent of the Ǧebl Miswer, Glaser decided despite the badness of the way and the approach of evening, to go back to Ḥaǧe. Luckily the Sejjid Hâdî had given them a guide who was free. Topographic observations could be made at first. That part of the range already known from the outward journey and situated near Ḍofîr, bears the name of Ǧebl Ǧeber. From it, at the place of Mabjan, a ridge called Šaʿb runs down into the Benî Marḥab valley. The village of Ḍanûb lies on it. From Mabjan a streamlet runs N. to the Ḳaḍáf district, at which point it joins a wâdî flowing between el-Ḳaile and Ǧebl ʿAmr. The thus augmented stream flows northward past the aforementioned ridge to the village of ʿIbâl, then turns S., finally entering the W. Ḥsêb as the W. Taḥmud. After unspeakable fatigue, Ḥaǧe was regained. It the pitch-black night, it would have been very easy to make a crash headlong into the depths below. The guide mentioned, however, new every stone of the way, and brought the charge entrusted to him safely down again.

The plan decided on the day before was actually put into practice. The descent into the W. Šéres, by the path already known from its ascent, went off rapidly. The market of Šéres on the valley floor was passed to the left. It consists of a number of stone huts, serving as merchanting establishments. Villages are to be found only on the heights. A halt was made just above, to water the mules. The next section of the route was into the main wâdî. Coffee gardens extended on both sides. It seems that a certain amount of shade is necessary for optimum results. The coffee shrubs are everywhere intermingled with shade-giving trees. Bananas, specially noted for their high quality, are particularly sought after for this purpose. About 1 p. m., the route changed its direction from S. E. to practically due S. At this point began the climb. It led up on to a range branching left and right from the Ǧebl Miswer knot, through a wâdî which, it was again noted, was bordered by coffee plantations. They crossed the range just mentioned from the W. Anḍar, which holds the village of Benî Mahdî, into W. Benî Ḥawár, which rises at Bejt ʿIḍâḳe. The former wâdî rises at el-Ḳufl, and is a left-bank tributary of the latter, joining it not far from Benî Mahdî. All the natives of these places showed the greatest animosity. The steep slope could hardly be negotiated by the laden muleteam. After leaving Benî Ḥawár el-Aʿlâ, they experienced some bad luck which would not have taken place if the two zaptiehs (police soldiers) accompanying them had given assistance. One of the four mules actually crashed headlong here. No great damage was done at this point as the baggage was saved. A much more serious loss happened a little later, however, namely the destruction of the large

sextant which had given so many good results. The ground of dissatisfaction of the police soldiers was the rate of pay, which did not allow very much for drinks. The dissatisfaction spread like wildfire. His two servants could not attent to everything alone. The natives gave no helping hand to aleviate his distress, and not once would they indicate the right track. There was nothing left but to send one of the two zaptiehs to the captain stationed at Bejt ʿIḏâḳe to get help. After waiting a long time, the zaptieh, however, did not return. With tremendous difficulty, they contrived to climb a little higher. Then another mule crashed, and all attempts to carry on were in vain. As night had fallen by this time, and the rising suḫmî (Tihâma mist) made the blackness even pitcher, the dangerous path along the ravine was quite out of the question. They had to find a spot for the night there and then. The muleteam was moved after an interval, the baggage again causing much difficulty. As they had not enough to eat with them, they had to stretch out hungry on the bare ground. The transport animals were made fast to the baggage. The idea of sleeping under these conditions was impossible. The cold, the unusual humidity and the corresponding dew, prevented it. After some further time, the zaptieh, who had been dispatched, returned with the message that neither the mudîr of Bejt ʿIḏâḳe nor the captain intended sending any help. Glaser gave the man who had come with the zaptieh a letter of recommendation from the major at Ḥaǧe and instructed him to tell the captain what the consequences of his treatment would be. The whole night had to be passed in these unbearable circumstances. The next day the exhausted mule-drivers entirely forsook their duties. At last the awaited soldiers arrived from Bejt ʿIḏâḳe. They explained that the letter sent had not reached them immediately and pretended they could not find his whereabouts. With their assistance, progress was soon made and the village of Bejt ʿIḏâḳe finally reached. The mudîr, with a huge sword girt about him, was already waiting for their entrance. Glaser rode by without responding to his salutations, and put up at a semsera farther on. The mudîr soon reappeared with the captain, and both attempted to clear themselves by all manner of excuses. As both functionaries seemed very friendly, and he needed their help in his work, he overlooked the incident and invited them to join him at his evening

meal. The remaining day did little to repair the losses sustained. Owing to a violent attack of fever, he had to lie down in the afternoon. Nevertheless, he climbed in the evening to the Ḳassaba north of the market-town.

On January 4th, 1884, the plan to climb the actual Ǧebl Miswer was put into action. The captain gave him soldiers to aid him. They set out shortly after sunrise towards the W. N. W. On the crest, the longitude and latitude were calculated, and important angles measured with a small sextant. Unfortunately, but a few places were visible. The phenomenon so often described before, was responsible for this. The Tihâma regions were submerged as though in a sea of clouds, only the highest peaks emerging. Later, the clouds reached even the summit of the Ǧebl Fâis, blocking the whole district with impenetrable fog. High humidity and heavy dew were the results. Despite the high vapour content of the atmosphere and the great altitude, no great cold was felt. As there was no possibility of collecting geographical material, they started on the return journey. Some topographic features observed on the ascent were checked up on the way down. The Ǧebl Miswer joins the Maṣânaʿa group in the east, the latter group forming the central knot of the entire mountain-system. It separates the W. Šéres from the W. Lâʿa. It contains several high peaks. The one farthest west is the highest. There the Ǧ. Bejt Fâis emerges. Its summit carries a ruined mesǧid. N. E. of it, the Ǧ. Mudmâr reaches the same altitude. In the depression between them lies the village of el-Máǧebe and the Bejt Fâis ruins at its foot. E. of this stretches the somewhat lower Ǧ. el-Maṣnaʿa. Likewise at a lower altitude is the Ǧ. Rumeiḥ with a village of the same name. Between it and the Ǧ. Maṣnaʿa is a ravine about 100 metres wide with perpendicular rock walls, known as the Bâb ed-Derb. North of Bejt ʿIḏâḳe there are to be seen two depressions. On the pointed rock between them stands the aforementioned tower of the Ḳassaba. Further E. there runs the Ǧ. Kilâlî. Then comes the Ǧ. Maḥdad forming part of the great Maṣânaʿa group. On reaching Bejt ʿIḏâḳe some more enquiries could be made concerning the lay-out of the drainage-system and the means of communication to the surrounding districts. The settlement itself consists of three sections: the Ḳarjat lying

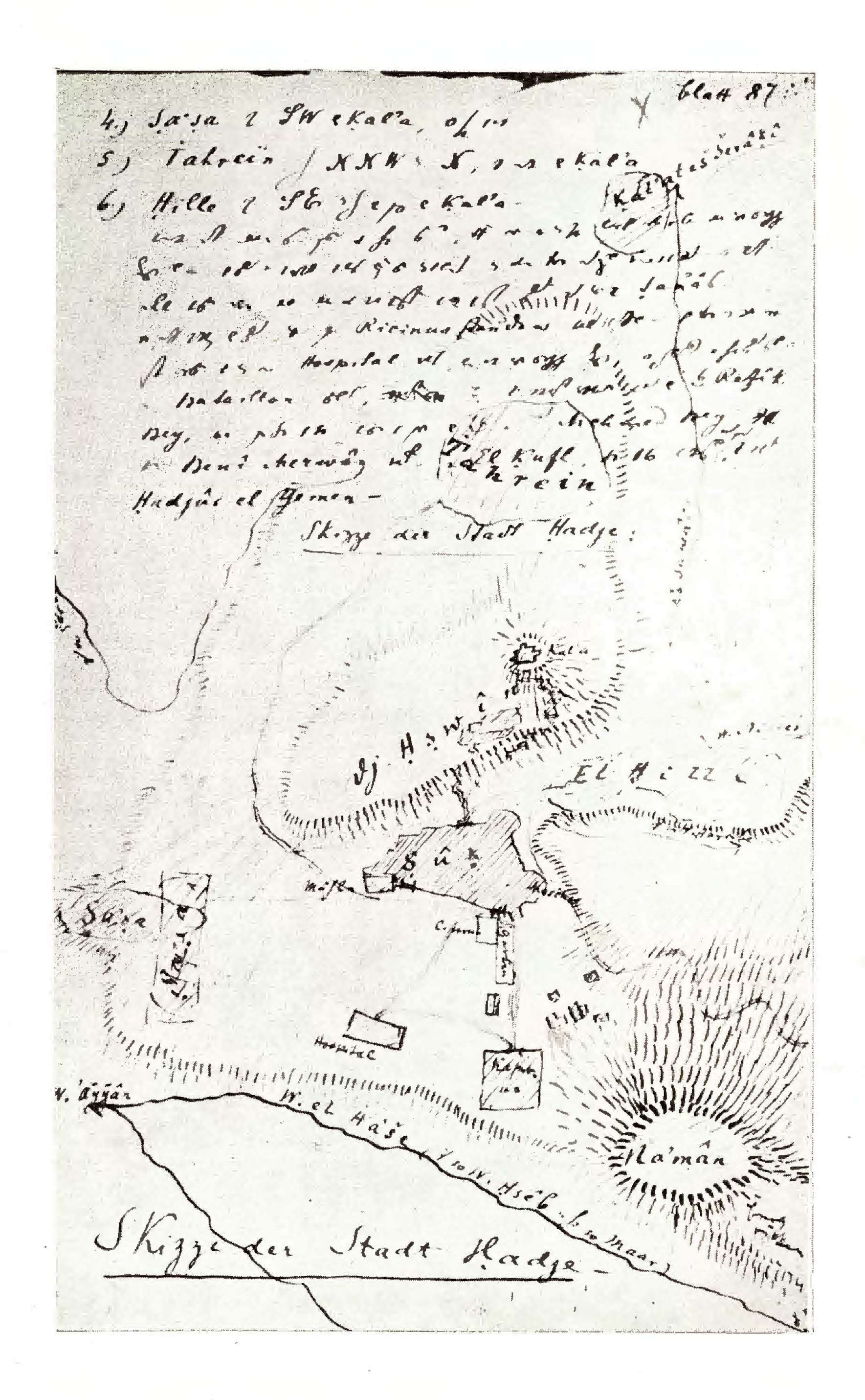
beneath the Ḳassaba, the Sûḳ in the centre, composed of stone huts and small houses, and east of this the considerable Jewish quarter. Altogether, it is a fairly large place.

On January 5th, there took place the journey from Bejt ʿIḏâḳe to Šibâm. The ride led first on the level along the southern side of the Ǧ. Kilâlî. From the Sûḳ es-Samîl ruins, could be seen the Koḥlân and ʿAffâr ranges. The route circumvented the head of the W. ʿAjâl ʿAlî and afluent of the W. Lâʿa which contains numerous villages. On the ridge between two arms of the wâdî stands Medîna. The left bank of the left arm is formed by a spur of the Maṣânaʿa group. It was not difficult to ascend. The way, which was a good one, was provided with steps. From the village, eṣ-Ṣâfî, the route was for a little while level, then mounted sharply again for 20 minutes. Here the top of the plateau was gained, rising high above isolated outliers of yellowish-brown rock. Apart from this, only the Ǧ. Miswer contains the so-frequently mentioned formation of stratified black slate. The Ǧ. Bejt ʿIlmân was circumvented and the village of the same name left 1/2 km. to the left. The route went now along the northern side of the Maṣânaʿa group in a more or less easterly direction. It passed a wâdî flowing from the Ǧ. Bejt ʿIlmân into the Šéres. Finally, the party turned S. E. through a gorge in one of the Maṣânaʿa ranges. After negotiating this gorge, they were able to make out the commencement of the great Wâdî Lâʿa, and to see as far as the Ḥuṣn Ṭawîle. A little later there was a view opening out into the Baun.

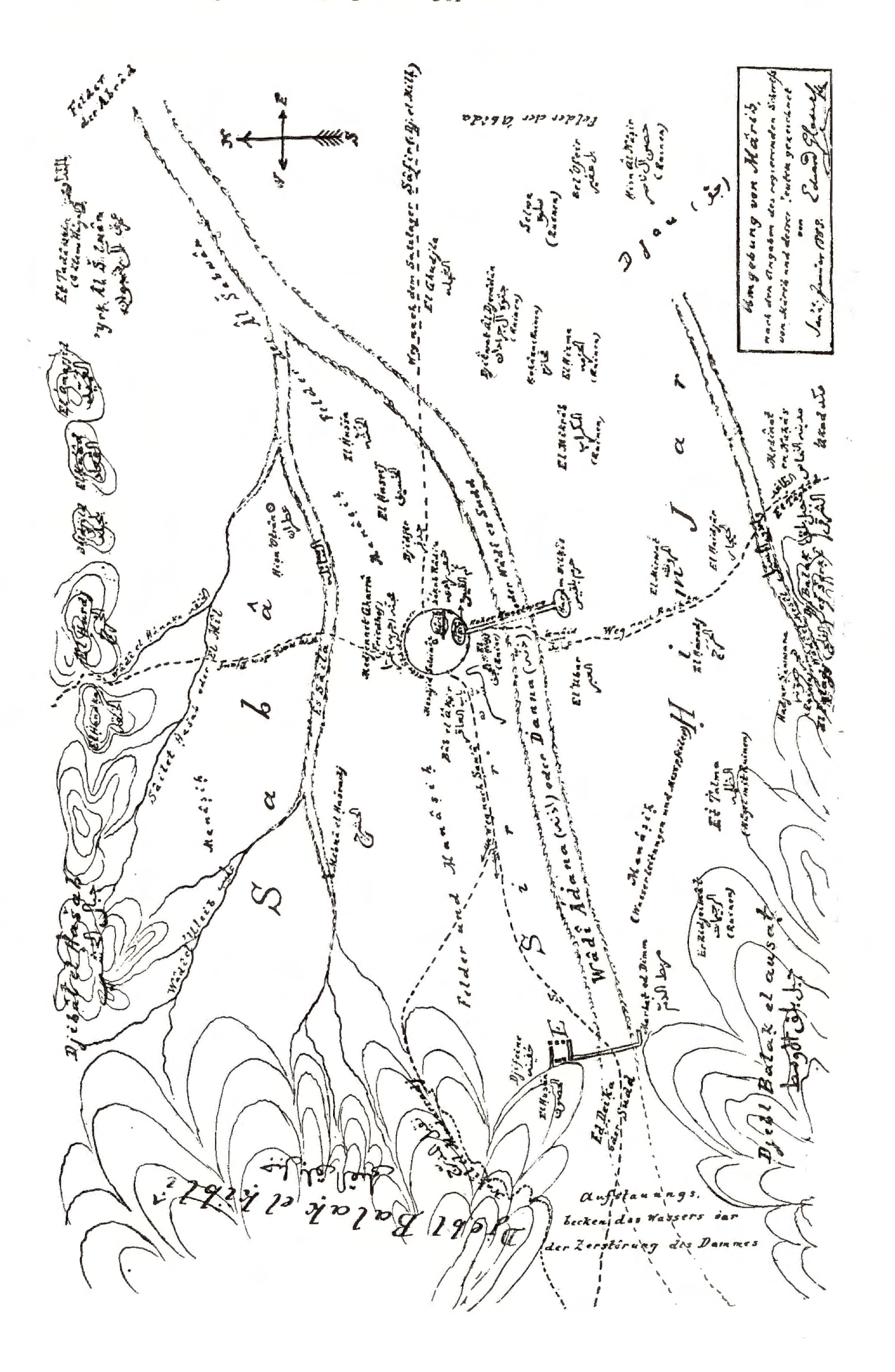
To the left on the southern slope of the range lay the village of Medaʿ. Farther on, the route passed westwards by the Ǧ. Šuḳbî and the Ǧ. Ḥaḏûr eš-Šêḫ. At this point began the actual descent, due south, into the Ḥabâbî valley. A very short distance away on the right there was the Ḍulâʿ range. After a nine hours journey via the town of Ḥabâbe, they arrived at Šibâm.

An important result of this excursion was the discovery that the Maṣânaʿa group formed the actual central knot of the whole mountain-system. All the ranges of the region form what may be termed off-shoots or spurs of this mighty mountain-chain.

As Glaser wished to visit Ṭawîla again from Šibâm on account of the



J. Werdecker, *North-West Yemen.*



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Širbab ruins, and this tour would include the Ǧ. Ḥaḍûr Nebbî Šuʿaib, and as he had received from the wâlî at Ṣanâʿ the information that he might be able to get to Saba, he decided to set out for Ṣanâʿ at once. The already known Šibâm-Ṣanâʿ route was used. A digression was made into the Hamdân village of Munaḳḳeb, which stands on a hill of porous lava. A halt was made at Bejt Naʿam. This place lies about 1/2 km. east of the wâdî. The wâdî comes from a long way south, and has steep banks on both sides. Only corn is grown there. The hill between the W. Ḍahr and the W. Ḍulâʿ, across which the route went after the halt, consisted of a finely shaped malachite formation. The explorer reached Ṣanâʿ safely, entering the town by the Bâb eṣ-Ṣabâḥ.

JOURNEY TO ARḤAB AND ḤÂŠID.

Almost the whole of January 1884 was occupied by discussions with the wâlî as to the best way of making an excursion into the far distant Ǧauf. Apart from Halévy, these regions had not been visited. The more superior of the Turkish officials showed Glaser a lively appreciation of his scientific efforts. There was present just at that time, the head of the great Ḍû Ḥusên tribe which maintained friendly relations with the Turks. Glaser held long conversations with the Šeiḫ Šâif and made careful enquiries concerning the regions over which he ruled. The latters said that they with the brother tribe of Ḍû Moḥammad had the greatest power in the Ǧauf and possessed the Ǧ. Baraṭ. There was continual hostility between the neighbouring tribes. He said finally that an excursion into the Ǧauf would be possible under his leadership. He returned to his district and promised to give information as soon as possible.

While waiting, Glaser occupied his time in repairing the damaged instruments and in ordering necessaries for the expedition. He made meteorological observations every day.

As he heard no more from the Šeiḫ Šâif, he asked the wâlî to allow him to undertake another expedition, and he was permitted to go to Ẓafâr and the country of the Ḥâšid Arabs. The arrangements were entered into warmly, and the wâlî did everything to make the excursion

a complete success. A letter of recomendation was dispatched to the Arḥab and Hâšid šeiḫs. They were made strictly responsible for any harm that should come to the explorer. This friendly protection on the part of the wâlî was a real consolation to Glaser, as relations with the European scientific world were completely severed.

He departed on January 31st, 1884. He left Ṣanâʿ by the Bâb Šuʿûb. Rauḍa was reached in one hour and a half, the travellers coming at this point to the wide river-plain of the Ḫâriṯ, then steering towards the village of Benî Ḫawât which they passed close to on the left. They crossed the Šuʿûb stream which comes down from Ṣanʿâ, and rode on between the villages of Bejt Rassâm and Bejt el-Barrâdî. Soon after, they quit the broad valley, as it turns away to the east. They reached the boundaries of Arḥab. The country began to rise slowly. The ground was formed everywhere of a black volcanic formation. Apart from a couple of inhabited ravines running eastwards, the place consisted of nothing but a stoney waste. The route led through the village of Bejt Makârîb to Bejt Sûʿ, which was just a small hamlet of a few houses. The reception of the place left nothing to be desired as regards entertainment and overnight lodgings. Next morning a large number of azimuths were measured from the terrace of the house belonging to the Šeiḫ. Just before noon, the explorer in the company of all the ʿOḳḳâls rode down to the Ḫubbe. The land near the Ǧ. Ḍurb carries this name. Past ʿOthân on a bare rubble void of vegetation the going was very heavy. As Glaser wished to see the el-Medînetein ruins, he turned left from the path, sending on his servants with most of the Arab attendants to Benî Ḫairân. The explorer kept his weapons ready as the country was deemed very unsafe. The el-Medînetein ruins lie in the Ḳâʿa between the Ǧ. Ḍurb and the Ḥuṣn Sened, which stands on the hill of Neǧd ez-Zebîb. It consists of a huge pile of stones, mostly of porous lava. There are no inscribed stones to be found here. Only the foundation walls of the Himyaritic Ḥuṣn Sened ruins are left. The finely hewn blocks of stone are held together without any mortar. The fortress, at the foot of which the town once lay, could be made out. Archaeological investigations were followed up by a number of compass readings and notes concerning the local topographic features. The Ḳâʿa Nisâl, on through which they had

to ride, stretches from the Ḥuṣn as far as Benî Ḫairân. An hour later, about sundown, they arrived before the village. They halted in front of a large berîk (water-basin). Then came news of a revolt raging in the village, and the announcement that the "Turks" might not enter. The natives of the Ḫubbe did not, in fact, acknowledge the suzerainty of the Turks. Glaser did not take the position too seriously, galloped up the hill and on through the dumbfounded crowd. He was received by the Šeiḫ. A description of the tumults arising after this, the fury of the people at being treated with extradition, and the awful scenes resulting, would take too long. After long negotiations, the natives became tractable and friendly enough to let Glaser make searching enquiries concerning the Ḥâšid and Bakîl people and the incidents between the two tribes.

The next day, February 2nd, the explorer come to Bejt Sinân or Ǧirʿân lying to the east. Left of the path, he visited the Laḥaǧ and Abjan ruins. They are not ancient, and are situated upon two white-coloured ranges which jut out into the black Ḳâʿa Ḥamrâ and are surrounded by the W. Laḥaǧ. This stream comes from the Ǧ. Kâmeʿ. Farther east, a rock juts out into the plain. The Ḥaǧar Ḍân ruins stand on it. The path carried on via Ḍarafât and northwards via Ḥaifa to Bejt Sinân. Near this place, the route led across the stratified formation of yellowish-white rock, which is already familiar to us and which the Arabs call balaḳ. It is overlain by patches of dark, porous lava in only on or two places. The šeiḫ's house is situated just a short distance south of the place. The Jewish quarter stands on a hill to the east.

The same day, news was brought by several ʿOḳḳâls from the region that the whole neighbourhood was disturbed by Glaser's arrival as he was taken to be a forerunner of further Turkish troops. They were impressed favourably by his explanations, and in the evening he was able to gather a good deal about the manners and customs of the Ḳabâil tribes[1]. They set out next morning to tell their inferiors.

After long deliberations, he made at noon on this day (February 3rd) an

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[1] See : Eduard GLASER, *Meine Reise durch Arḥab und Ḥâšid. Petermanns Mitteilungen.* XXX (1884), pp. 175-178.

excursion to the Ṣirwâḥ ruins. His departure was made with great pomp. After crossing an east-flowing wâdî, the village of Bejt Ḳais was reached and soon after the hill-ruins of Ḥağar Arḥab, which serves as an assembly place for the whole of the Arḥab in discussing important affairs. Despite all precautionary measures, thousands of Arabs had congregated in the place and the accompanying šeiḫ prevented Glaser being mobbed only with great difficulty. Nevertheless, Glaser carried out his archaeological investigations. The most important things still left in these extensive ruins were the foundation-walls and the bases of the colonnades. Besides this, there was and almost entirely destroyed mesğid, lying to the S. North of the ruins, running N. W.-S. E. was the Ğ. Šábaḳe, uniting with the Etwa-Riâm range. The Ğ. er-Rûs stretches to the west of here. The ruins themselves and the area south of them, consist of black rock, the other land of white.

During this excursion, they had learnt that the insurgents had occupied the two villages, Riâm and Etwa which the explorer wished to visit that day. They did not succeed in visiting Medr. They had to return to Bejt Ḳais and stay there overnight. Quarters were found in a tall building with a tower. In fear of a surprise attack, the best of sleep was impossible.

Attempts to reconcile the rebels in Riâm and Etwa next day were made in vain. Glaser already wished himself back in Ṣanʿâ. He was prevented from this by the ʿOḳḳâls, as they had him in their care and would be punished by the Wâlî.

After interminable deliberations a decision was made to set out for Ẓafâr. The shortest way thither led actually across the region of the Benî Suleimân, through the W. Ḥalḥal. Once more, following the advice of the šeiḫ the villages of Šeṣṣarîm and Ğirbet Benî ʿAlî were avoided. The march began at 1 p. m. on February 4th. It went up the E. S. E.-flowing W. Madrîn. After two hours and a half the route turned to the W. N. W. Here they came very close to the Ḥâšid frontier. Unlike the locality of Bejt Ḳais, where only a few outcrops of the black formation were to be seen, the plateau and the Ḳâʿa Haum west of the Ğ. er-Rûs are well cultivated. From this, the route descended slowly into a valley, which at Hâvam turns from N. W. to N., east of the W. Maḥṣam. After crossing the mountain-slope opposite, they reached the N. W. running Ḳâʿa Madám which has three villages. The extraordinarily steep right bank of this Ḳâʿa was finally surmounted. A short way farther on, and the travellers came to Šeṣṣarîm itself, where they were greeted in a very friendly fashion. It had taken them five hours since their departure.

As the visibility was good, on the south and south-east the next morning, observations were made of various positions. South of the town, the wâdî which flows S. W. into Šeṣṣarîm, turns eastwards into the W. Maḥṣam. During the forenoon, they went to the Ğirbet Benî ʿAlî. The mountain of Marâbeṭ el-Ḥail, barely 1 1/2 km. to the N. N. W. was climbed next. To left and right from the range joining, there flowed a number of wâdîs. The fine view was used in making a small free-hand drawing. Their first objective was reached about 2 p. m. after having descended a slope. A good reception awaited them at the house of the šeiḫ.

After a short distance, for the third time already on this particular journey, a mob a quite frightening dimensions was met with. The opinion among the crowd was that the accompanying ʿOḳḳâls had sold the Ḥuṣn Ẓafâr to the Turkish government. It was further supposed that a colony of the Benî Radmân tribe that had been planted there, had been destroyed by the Turks. This was an excellent opportunity for the tribe to kill off the Turks in a vendetta. A description of the excited mobs cannot be entered into any further here[1]. At last the Šeiḫ let the embittered natives attend a conference, in which he reproached the Turks with a whole catalogue of iniquities. Only after this did the Turkish Government get satisfaction, obtain comparative quiet and remain on peaceful terms with the wild Ḳabîle.

A friendly state of affairs could not be expected on the following morning, and so Glaser determined after many discussions to get to Ẓafâr as soon as possible, in order to visit the Ḥâšid Arab country. He left this dangerous spot in the afternoon, and descended into the village of Ḥalḥal after a difficult two hours march. The wretched village consists

[1] See : Eduard Glaser, *Meine Reise durch Arḥab und Ḥâšid. Petermanns Mitteilungen.* XXX (1884), pp. 205-206.

of just a few houses, standing on an eminence N. E. of the Ġirbet Benî ʿAlî. In the Wâdî Ḥalḥal, which flows from the S., there were seen the characteristic daum-trees, which carry small, yellow, apple-like fruits. The fruits are no larger than a hazel-nut. The whole valley is very poor, and the inhabitants are not blessed with wealth. They run about almost naked.

Before resuming the route, there were interminable discussions again about the difficulties that would again be made. Only after knowing that they were already in Ḥâšid country would they proceed, breaking camp on February 7th, at 9.15 a. m. Going down the valley, they soon reached the village of Ṣaddân, going on into the W. Šwâba. This is one of the many names of the valleys coming from Šibâm and ʿAmrân. It has here the direction W. E. It is limited on both sides by mountain-peaks. The vegetation is poor. Only some daum-trees are to be seen. Little arable land can be won from the black rock formation. Farther on, the valley bears the names of W. ʿAṭṭâf and Ġeil Hirrân. W. N. W. of here, the whitewashed mosque of Ẓafâr gleamed above the valley, over which the route now crossed towards it. The idea of getting to the top of the mountain before noon was unfortunately not realisable. The altitude of the sun had, therefore, to be measured from the actual valley. The halting point was barely 1 km. out of Ẓafâr. After this, the mountain was climbed.

Ẓafâr, formerly the seat of an Imâm or Ḥalife, has some ruins falling into decay. Very well preserved are the five inter-connecting cisterns from which people often carry water to places hours distant, owing to the scarcity of water there. They drew the water up by ropes. The ruined town consist of three sections : Ḥağar, Ḳâhira and Ḳufl. The Ḥağar is very steep and bears the already described mosque. To the N. W. there stretches up the high Ġ. Ṣaulân, which forms the western limit to the W. Warwar that flows into the W. Šwâba. The Ġ. Ḳunna, Taʿizz and Taffa which belong to it, are quite near. East of the W. Warwar there extends the Ġ. Ṣubâra. As everywhere else in Arḥab, his work was destroyed and he had to content himself with a small croquis. There was no point in making azimuthal measurements as the unfriendly natives refused to tell him the names of the objects relative thereto.

At 4 p. m. the explorer climbed by means of a small path S. W. towards Ḥâšid, after making many enquiries concerning the condition of things there. As Ḥâšid was a place of the most evil repute, Glaser experienced very unpleasant feelings. In his opinion nothing could be more dangerous than if it was going back through Arḥab. The Ḥâšid Arabs had already gathered in readiness in rank and file. The two groups, deadly enemies of one another, had come face to face, and during the ceremonial connected with salutations, Glaser had seen nothing. The members of the Ḥâšid party were very friendly, and despite their wild appearance made quite a good impression. Glaser took leave of the Bakîl šeiḫ and set out towards the W. Ḏî Bîn. The town of Ḏî Bîn lying in this wâdî was avoided, as the inhabitants were said to be unfriendly. It stands on a hill left of the river-bed, and is actually enclosed by walls, but not large. Only after the sun had set did the explorer get to Bejt Ġuzzî, far back along the valley. Its left bank is unusually steep. From the slope and the heights, the well-built houses look like castles. The whole region gets its water from the cisterns at Bejt Ġuzzî. The place received him well, though obviously very poor.

Next morning, he carried out a calculation of the longitude. Later enquiries were made concerning the site of Ḥâšid, and the divisions of the tribe. The messenger who had already been sent the day before to ʿAraḳet el-Ḳudeimî in the ʿAjâl Sorêh district, returned and reported that the local šeiḫ would be awaiting him on the frontier the next day. In the evening about 150 adventurous looking figures assembled in the šeiḫ's house to greet the explorer and give him all possible chance of conversation.

Early in the morning of February 8th, the departure took place. The great wâdî was reached after an hour. It stretches out, stoney and bare of vegetation. It is formed of volcanic rock from Bejt Hárraš to Reida, and therefore has very few fertile parts. Rain comes very infrequently and in small amounts. The cisterns are usually dried up. Only ḏurra and a little barley are grown. The only product is the wood of the drought-resisting daum-tree. The formerly existing vineyards have disappeared.

The direction turned more and more out of the S. E. into the S. W.

The going was very difficult across the fêš (stony-waste). At last, they reached the Benî Ǧubar borders and entered the Ṣajad country. A tower has been erected at this point. As far as here, about 100 Arabs had acted as company and escort. The awaited šeiḫ had been delegated to act as company through the Ṣajad country on account of his acknowledged power over the regions N. E. of ʿAmrân; he appeared only after a long wait. He had been searching in vain for more than an hour. The powerful, though old and gouty, Šeiḫ, whom Glaser knew from ʿAmrân, had been on his way back, and they had only fallen in with him at a later point.

They rode through the Bâb el-Manḳaḍe, that is formed of a spur of the Ǧebl Ḍerwe and Ǧ. Janûr and offers an entrance into the great Ḳâʿa eš-Šems and the Ḳâʿa Ḥais. They carried on through a depressing fêš. There are almost no villages here. Groups of houses are to be seen only on the mountain-slopes. The left bank of the dry valley is shut in by steep rocks, in which there is some entrenching but no actual tributary wâdîs. The right bank ascends gradually, interrupted by numerous basaltic crags. Some barley is cultivated on the slopes. The people appear desparately poor and call forth one's pity.

At last the Ḳâʿa was left, and a gentle slope led to Ḳarjat ibn Ḥâǧib at the foot of the Ǧ. Ṭanein. Reception in this village was excellent. The next morning some important azimuthal measurements were carried out. The great Ǧebl Ḳânit lies to the N. and N. E.

Going on farther to Nâʿaṭ, the direct route to this place was abandoned, so that a digression could be made by way of the Ǧ. Ṭanein. The east-slope of the mountain is, almost up to the top, composed of a black basaltic formation. Otherwise there is mostly white rock around here. At the upper end of this formation, a valuable inscribed stone was discovered. Its great age was obvious. Near the sacred tomb of the Welî Ḫâlid on the top of the Ǧ. Ṭanein, some measurements were made to fix its orientation. The spot was surrounded by many basaltic crags. The Ǧ. Ṭanein surpasses all the neighbouring heights. The frequently described juxtaposition of balaḳ (white) and dark rock can be seen here also. Similarly on the Ǧebl Ḳânit, there are three black crags standing out on a white foreground.

After finishing the work on the mountain, the explorer descended into the village of el-Ḥaǧar, where a longer rest was called. The W. el-Ḥaǧar, on the right bank of which lies the place, flows northwards carries the name of Fôḳâm and flows into the Ḳâʿa Ḥais.

On receiving the news that entrance into Nâʿaṭ was refused, the expert messenger were sent to bring the inhabitants to reason. As they hadn't returned after waiting some time, the explorer decided to go on to ʿAraḳet el-Ḳudeimî. On the way thither, they met the messengers who had been dispatched, together with representatives from Nâʿaṭ. They explained that there would be no possible opposition to bringing them there the same night. They were obliged therefore to carry out the already arranged plan with speed. They went first to Liǧâm. This village is situated on the southernmost slope of the Ǧ. Ṭanein which falls into the W. Liǧâm. The actual wâdî flows W., then turns N. to join the Baun. The climb down to the valley bottom was very steep. They then crossed over the range of the Muḥawwa, from which familiar regions could again be overlooked, and after a lengthy descent came to ʿAraḳet el-Ḳudeimî which stands on a small hill. The living room of the šeiḫ's residence lacked every comfort. This state of affairs was however forgotten in the warmness of the welcome.

On the morning of February 11th, the familiar azimuthal measurements were carried out, then some old ruins visited at the western foot of the hill called Ḫarâb Šâḥiḍ, and finally camp was broken to leave for Nâʿaṭ. In the course of the morning messengers were met with the information that everything was in order.

A strong contingent from ʿAraḳet accompanied the explorer to the place, which was probably established by the Arḥab people. Even during his archaeological work there arose a frightful tumult, and the party had to fly before the enraged inhabitants. Before making the swift journey back, Glaser addressed the people firmly and seriously. This and the brave conduct of the šeiḫ of ʿAraḳet in his negotiations with the mob, finally resulted in the wild people deciding not to hinder the explorer any further. Glaser returned to the town once more and completed his work in every detail. Besides archaeological studies, there were some topographic observations.

The moderately large village of Nâ'aṭ lies at the edge of a high plateau. Ligâm lies deeper below it. The range on which Nâ'aṭ is found runs N. N. W. between the W. Fôḳâm and the W. Maḥdâm, and then tapers off into the Ḳâ'a Ḥais. It carries the names of Ǧ. Aḏra'. To the S. E. there is the Ḳâ'a el-Berîk. The path to the village from the S., is cut out of the living rock. The actual region of ruins contains numberless remains, and lies N. W. of the place. Here, as well as in the southwestern part of the settlement, several old stones were discovered bearing inscriptions. As soon as investigations were finished, they decamped for 'Araḳet, glad to get out of such a ticklish situation with a whole hide. The place was reached in one hour and a half. The evening was occupied in discussion concerning the laws of the southern Arabians.

9 a. m. on February 12th saw their departure from 'Araḳet. Ṣan'â was to be reached the next day. They were not going to take the direct route via Arḥab, but were going to travel through the region of 'Ajâl Sorêh and Hamdân. They moved gradually southwards, via the village of Ḍêfân on the eastern slope of a volcanic hill of the same name, through the Ḳâ'a Ḥams and the Ḳâ'a Ḥais, which is separated from the former by merely a low crest. The country was little cultivated, but there were everywhere signs of a developed culture in former times. The great Ǧ. Ḍîn lay close right of the way. The travellers then entered a gloomy fêš. Black sand only, and no vegetation. It takes the name Ḳâ'a Serǧên. Passing by the Ǧerbân which lies a fair distance to the right, the travellers descended S. E. into a valley. The village of Ḍarwân has been built on the steep right bank of this wâdî. The familiar Ṣan'â—'Amrân route had already been reached. Near Ma'mer it was left again, as they wished to put up for the night at the semsera about 1 km. north of the village el-Ḥâurî (in the Ḳâ'a er-Riḳḳa). This inn actually belongs to Hamdân. The accompanying Ḥâšid Arabs had, therefore, no unpleasantness to fear.

They decamped early on February 13th, reaching the main route by way of Ǧedr, arriving safely at their destination.

Glaser stayed in Ṣan'â for about one month. Extensive preparations were made during this time for a journey to Mârib, the former capital of the Sabayitic Arabs. It was already practically certain. Yet at the last moment the plan fell through, because he was deprived of all his property and assistance was refused him on all sides. Help from the kindhearted Governor-General, the often mentioned Wâlî 'Izzet Paša, who had always tried to further his efforts, was to be thanked for Glaser being able to return to Europe in the middle of March 1884.

Besides the preparations for the journey to Mârib, in the time between the middle of February and the middle of March, he made enquiries concerning the tribal divisions, the conditions of health in Yemen and the positions of the districts, wâdîs and mountains mentioned by the Al-Hamdânî. Furthermore, he showed a lively interest in the commerce, trade and industry of the whole of Yemen, and made a number of discerning remarks relative to the same. Lastly, he made a critical evaluation of the occupation of the country by the Turks, the personality of the existing Governor-General, 'Izzet Paša and their crafty politics.

On March 12th, the journey from Ṣan'â to Ḥodeida took place. The general observations made during this journey were not utilised in the production of a map. They completed merely the picture Glaser had got of the Ḥodeida-Ṣan'â route on his second great expedition [1]. The son of a Neapolitan doctor in Turkish employ, Vittore Sbordone, was his companion this time. The route led via Mind to Mettne. On account of heavy rain the plan to climb the Ǧebl Ḥaḍûr Nebbî Šu'aib was abandoned. From Bau'ân they travelled via the Ḳarn el-Wa'l to Sûḳ el-Ḥamîs, where they spent the night.

Next morning from here they descended until the W. Mefḥak was reached. The next station on the route was the place 'Eǧz. After a short rest, they crossed a low ridge and entered a wâdî which flows east of the Ǧebl Šibâm Ḥarâz and Menâḫa to the N. W. An extraordinarily steep wâdî provided the acent to the place of Menâḫa. The coffee plantations here stretch almost up to the settlement, which is situated at about 2300 metres.

On March 14th, the crest of the Ǧebl Šibâm Ḥarâz was crossed on the way to 'Aṯṯâra. They descended into the village of Ḥoǧeila in the Wâdî

[1] See : E. GLASER, *Von Hodeida nach Ṣan'â* vom 24. April bis 1. Mai 1885. *Petermanns Mitteilungen.* XXXII (1886), p. 1-10, 33-48.

Ḥiğân, which is bordered by the Ǧebl Ṣaʿfân on the right and the Ǧebl Ussil on the left. Quarters were found here for the night.

On March 15th, the travellers made for Ḳahwet el-Ḫabt via Boḥâḥ and Bâğil. From Ḥoğeila they were under the influence of Tihâma. Their limbes were paralysed by the sultry heat accompanied by a high relative humidity. In place of stone huts there were simple huts made from wood and shrubbery. The inhabitants are very dark skinned. They are less intelligent. Their dress differs somewhat from that of the hillfolk. Boḥâḥ lies on the southern slope of the Ǧebl Ḏâmir, which joins the Ǧebl Buraʿ farther to the S. E. They are separated from one another by the Wâdî Sahâm. The route entered into a small wâdî along the edge of the Ǧebl Ḏâmir and then turned W. S. W. The afternoon was spent resting in Bâğil as the great heat prevented further travel. They set out again in the evening, in three hours and a half after midnight they reached the often mentioned coffeehouse of Ḳahwet el-Ḫabt, which is situated within the sand-waste. They kept indoors all day, where it was hot but airy.

In the early hours of March 17th, they started on the last part of the way back, put up with the Commandant Aḥmed Paša to wait for the next ship to return to Europe.

The results of this expedition are very extensive. Archaeology was enriched thereby. 276 specimens of Sabayitic inscriptions were, together with the notes in explanation, handed over to the possession of the French Academy of Inscriptions. As can be seen from the description published, geographical knowledge was particularly benefited. The opening up of the ancient culture region N. W. of Ṣanʿâ stands to Glaser's lasting credit. The exploration of these regions has only been taken on hand in very recent times and his account completed at some points. There must be mentioned also the many astronomical observations which the explorer put down in a separate manuscript. Besides a series of points fixed for the first time, there is also here an interesting description of the phenomenon of the zodiacal lights. His experience in astronomical work on the staff of the Vienna Observatory stood him in good stead in regard to this. Lastly, mention may be made concerning the regularly made meteorological readings. The journal relative to

these comprises 46 leaves closely written on both sides, as well as the extensive material of the text in shorthand. No continuous observations of this kind had been made in Yemen before the time of Glaser. They are therefore without doubt of high value. The continual temperature and pressure readings that Glaser made on his individual journeys make a considerable contribution to the geographical picture that he has drawn in his "Geographischen Forschungen". Both the astronomical and meteorological journals were later dealt with and the results published[1].

DESCRIPTION

OF THE 2ND, 3RD AND 4TH JOURNEYS

OF EXPLORATION AND RESULTS OF SAME.

In the following pages a short summary will be given of the other journeys made by Glaser in S. Arabia. His second expedition was a continuation of the first in all respects. He had only 800 florins granted to him by the Austrian Ministry of Culture and Instruction. Most of the expense was borne out of the proceeds of the sale of his collections of the first journey, and by relatives and patrons. The regions S. E. and S. of Ṣanʿâ were to be investigated this time. He went from Ḥodeida via Bâğil, Boḥâḥ and Ḥoğeila, over the Ḥarâz mountain-knot to Menâḫa, from here to Mefḥak, Sûḳ el-Ḫamîs, and across the Ḳarn el-Wa'l to Bauʿân, finally crossing a spur of the Ǧebl Ḥaḍûr to Mettne, and so on to Mind and the Reiʿan mountains, down from which a steep descent led to Ṣanʿâ.

Glaser wrote a careful account of this tour of April 24th to May 1st, 1885[2]. Included with it is the "preliminary" sketch-map of the

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(1) H. Krumpholz, *Eduard Glasers astronomische Beobachtungen im Jemen im Jahre 1883. Sitzungsber. d. kais. Akad. d. Wiss. in Wien. Math. nat. Klasse,* Vol. CXX, section IIa, 1911, pp. 1897-1935.

J. v. Hann, *Ergebnisse aus Dr. E. Glasers meteorologischen Beobachtungen in Ṣanʿâ (el-Jemen).* Ibidem. pp. 1833-1896.

(2) Eduard Glaser, *Von Ḥodeida nach Ṣanʿâ* vom 24. April bis 1. Mai 1885. *Petermanns Mitteilungen.* XXXII (1886), pp. 1-10, 33-48. With map 1 : 500.000.

regions visited on the first expedition, and the basis of the English maps. After several journeys N. and E. of Ṣanʿâ, he visited regions entirely new to him. He thoroughly inspected the country lying along the route to ʿAden, which he entered on January 30th, 1886. Archaeological investigations played a large part. The ruins of Ẓafâr received especial attention. He was successful in bringing to Europe a number of original stones, the Minayitic inscriptions being presented to the British Museum, and the Sabayitic to the Berlin Museum. The Berlin National Library (Staatsbibliothek) took over valuable Arabic manuscripts to the number of 250. According to Glaser [1], the sextant, chronometer, boussole, aneroid and thermometer all played a great rôle on this expedition and were in regular use. Important results were obtained from the valuable geographic, meteorological and linguistic work. It was collected such a material that it could not be mastered before years [2]. The sketch-book kept with such pains by the explorer speaks well for his carefulness. On this occasion Glaser unfortunately omitted, probably for some cogent reasons, to determine (astronomically) the latitude and longitude of the fixed points. Only the Ḥodeida-Ṣanʿâ route was dealt with in detail in the aforementioned monologue. The journals relating to the other part of the journey have not yet been evaluated or published even. The proceeds of the sale of his collections was of considerable material assistance to Glaser. He was waiting now only for sufficient funds for his next journey.

This took place between October 1887 and September 1888. Only the modest sum of 1800 marks was given by the Prussian Academy of Science as a contribution to him. His main idea was to visit Mârib, the old metropolis of the Sabaeans. Arnaud and Halévy had, as has been said, been there before him. Their scientific contributions, however, had been trifling. Glaser succeeded in getting to Mârib and putting his forerunners' scientific investigations into the shade.

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[1] Eduard GLASER, *Über meine Reise in Arabien. Vortrag von Eduard Glaser in der k. k. Geogr. Gesellschaft* am 26. Okt. 1886. *Mitteilungen der k. k. Geogr. Gesell. in Wien.* XXX (1887), p. 19 ff.

[2] *Ibid.* p. 19.

This time he began his journey into the interior from ʿAden, where he landed on October 29th, 1887. He travelled through the entire region between ʿAden and Ṣanʿâ, particularly the western part bordering the coast of southern Yemen. Very important results were obtained from a stop made in Taʿizz. A trip was made from here to the famous Ǧebl Sabr. Further, the well-known coffee country of Jbb and Udein was visited. Lastly, Glaser covered the whole Tihâma from Zebîd via Bejt el-Faḳîh to Ḥoǧeila, and arrived at Ṣanʿâ after a 44 days expedition.

The lengthy stay which now followed in this town was used by the explorer to make careful enquiries of the natives about the neighbourhood, examining new informants again and again most meticulously.

From March 17th to April 24th, 1888, there took place the memorable excursion to Mârib which lies five days journey east of Ṣanʿâ. Glaser received real assistance in the furtherance of his scientific plans from the Wâlî Osman Paša, then Governor of Yemen. He left the capital in the depths of the night disguised as a fekîh or learned man. Experiencing many exciting incidents, he travelled through the country of the Tzabyan Bedouins and the Al-Ǧahm. In four days he reached the famous ruined embankment, and on the same day entered the town of Mârîb itself. The work carried out amongst the ruins of the ancient Sabayitic town some kilometres away, almost cost him his life, for the natives of this region took him to be one of the hated Turks. Furthermore, the tribes living in the vicinity had spread the tale that the foreigner was looking for treasure and would steal it by copying down inscriptions. Only with tremendous effort, therefore, did he bring his work to a successful close in face of these difficulties. Under such conditions the explorer had to carry out his archaeological, linguistic, topographic and ethnographic studies. The first of these was particularly important. The finds in inscriptions on the Mârib embankment and neighbouring ruins were extraordinarily rich. However, from our point of view, his topographic surveys and the enquiries relative to the same are of greater service and particularly arouse our interest. He set down on this journey for the first time, a detailed map of the entirely unknown regions, on the scale of 1 : 250.000. It was based on the numerous sketch-maps made for that purpose. As these, however, were of a very different standard of

exactness, the large map, therefore, is correspondingly inconsistent. The explorer is not to be denied acknowledgement on this account. It is essentially due to him that the positions of the individual points were brought into a more or less useable state, so that his contemporaries could get an approximate picture of an historically significant culture region. The astonishing fulness of his topographic surveys, at all events, deserve unlimited praise [1].

He had to give up the idea of visiting the Ǧôf, so rich in inscriptions, as funds were not forthcoming. The heads of the local tribes had appeared in Mârib in order to conduct him into their country. At no other time was there such an opportunity of securing a certain gain. There was however, an entire lack of the necessary financial support. He reached Ṣanʿâ after a march full of dangerous adventures. Therefore, no European since Halévy has penetrated that particular terrain, and the information brought by that explorer concerning the ancient culture-region has still to be verified, by actual surveys.

In Ṣanʿâ Glaser worked at the compilation of a great travel-work which was to bear the name of "Saba". Only after the death of the explorer, however, was is that this work was published in connection with the journals kept and the topographic surveys made on this journey [2].

He returned to Europe via ʿAden.

The next expedition made by Glaser to southern Arabia was only after an interval of four years. It falls in the period between the beginning of 1892 and the early part of 1894. The Prague German Society for the promotion of Science, Arts and Literature in Bohemia had given him a contribution of 8000 florins. He left ʿAden for Ṣanʿâ on September 22nd, 1892. He went on hoarsback from Laḥeg for Taʿizz. From Ṣanʿâ, he departed on October 7th, crossing the Ḳâʿa el-Ǧenedîje and reached Jbb, where he had to lay up for several days on account of an

[1] A. Feuerstein, *Bemerkungen zur Karte der Reise E. Glasers von Ṣanʿâ nach Mârib.* In: Eduard Glasers *Reise nach Mârib.* Published by David Heinrich Müller and N. Rhodokanakis. Vienna 1913, pp. 210-214.

[2] Eduard Glasers *Reise nach Mârib,* Published by David Heinrich Müller and N. Rhodokanakis. Glaser Collection I. Vienna 1913.

attack of fever. The next stop was the town of Jerîm, which he reached via Maḥâdir. On October 16th the explorer visited Ḏamâr, where he copied out some inscriptions and took photographs. From here he travelled via Maʿber to Waʿlân, and then on October 20th via Ḥizjez to Ṣanʿâ itself.

As a great revolt broke out all over the country in 1891 against the Turkish suzerainty, the resulting insecurity made it impossible to realised the tours which had been planned, especially that to the Ǧôf. For all that, this particular expedition was more important from the point of view of archaeology than any of its forerunners. Glaser used an entirely new system on it for getting inscriptions. In a letter sent on February 15th, 1893 from Ṣanʿâ to Professor Hommel at Munich, there is the following in reference to this matter : "I have trained ordinary Bedouins to print off and copy inscriptions. I have a whole body of such assistants, furnished with metal box, paper, lead-pencil and brush, getting material down according to all points of and tracing it off with the least detail correct, in regions where no European will ever tread..... I have gone into everything very carefully with a view to its scientific value and I can truly say that my results are at least as good, even up to now, as those of my three previous expeditions" [1]. A further result was the discovery of some 100 Katabanic inscriptions. Through these was obtained the first glimpse into the history of this unknown people.

The writing up of the geographic work during the enforced wait in Ṣanʿâ was again commenced. Especially valuable were the investigations made into Hamdânî's Geography of the Arabian peninsula. This work, published in 900 A.D., contains very many names without the exact description of their positions. All those mentioned as being in Yemen were localised by Glaser on this particular expedition. Careful linguistic studies and the collection of valuable Arabic manuscripts are also not to be forgotten. These last are now ornamenting the Vienna Court-Library (Wiener Hofbibliothek). The collection made at the same time of ancient

[1] Printed by Otto Weber : Eduard Glasers *Forschungsreisen in Südarabien. Der alte Orient, 10,* Annual series 1909, pp. 23-25.

remains, sculptures and coins is to be found in the Vienna Museum (Kunsthistorisches Hofmuseum).

As the numerous informants and porters all wanted good money for the work they did, Glaser found himself in very poor straits. His urgent pleas for further assistance were met with a deaf ear. In the early part of 1894 he had therefore to think of returning home.

He did not visit Arab lands again. He did try in 1907 to get to Ṣanʿâ to make a further journey and bring back more material for the furtherance of scientific knowledge. Nothing came of this plan however for he fell seriously ill, and died in the following year.

THE BASIS USED IN PRODUCING A MAP

OF THE REGIONS EXPLORED ON THE 1ST EXPEDITION,

THE DETAILS OF THE MAP-WORK

AND A DISCUSSION OF THE FINISHED PRODUCTION.

As already remarked in the introduction, the map accompanying the thesis was produced on the basis of the estimates included in the "Geographischen Forschungen in Jemen". These were put down by Glaser when he returned to Ṣanʿâ from excursions he had made from the town, from the details in his journals. The work was begun on February 28th, 1884. Apart from the proper names and the Arabic characters, it was written entirely in Gabelsberg shorthand. In the 142 leaves (format 22 : 12.8 cm.), not only the courses of the actual excursions are carefully described, but also everything in any way related to the topography and the physical geography. An extract from these copious estimates was brought into an earlier section.

In constructing the map, the measurements made with the instrument carried must be considered. The description of the neighbourhood at each of the halting-places on the journey does, indeed, provide a clear and complete picture, but does not form so valuable or necessary a frame-

work on which to start the construction of a map. Of greater importance are the sketch-maps which Glaser made, with marvellous accuracy, at the important points. There are 40 of these in existence. They are on various scales, from the general map of the country or the greater part of it, made at the beginning of his activities as an explorer, up to the careful town-plans of Kaukabân and Ḥaǧe, which are on the scale of approximately 1 : 20.000 and 1 : 15.000. The first setting out of these was done very well. The later checking-up was not done so carefully. Most of the show more less extensive errors. Those sketch-maps carried out on a large scale are naturally the most accurately done.

The measurements made with the aid of instruments are of an astronomic and geodetic nature. During his assistantship at the Vienna Observatory from 1878 to 1880, Glaser had useful experience in the use of instruments such as were needed on his journeys of exploration. The quality of the observations bears testimony thereto. The astronomical measurements were absolutely necessary, since there must be at least one fixed point from which to carry on further geodetic work. As seen already in the account of the journey, a whole series of astronomical observations were carried out for various places. The latitude and longitude of 13 points were determined in this way. To what extent these determinations of fixed points can claim to be accurate, will later be set forth. The geodetic measurements resolve themselves into the determination of the angles between the various points visible from one position, and the fixing of the azimuths of individual objects. As all three measurements serve one end, namely fixing the positions of the objects selected from the landscape, they must therefore be submitted to a reciprocal testing, if each is to be one and the same point. This fact was of great importance while drawing the map.

The following instruments were used in the geographical work of the journey : one gold and one silver pocket-chronometer, the first of which had a very good movement and was made the most use of, further, a large mirror sextant, with an error of 5″ out of the horizontal, and a small sextant with an error of 1′ containing artificial horizons, a compass and lastly a terestrial telescope with a focal length of approximately one metre. At first, the observations were carried out only with the gold

chronometer and large sextant. These were both badly damaged by an unfortunate occurrence. As already explained in the description of the route, Glaser's servant let the gold chronometer fall onto a rock while they were engaged in fixing the position of a point on the top of the Ğebl Nuķûm, the date being November 16th, 1883, the servant thereby splintering the glass and even damaging the timepiece itself. Set working again, it gave impossible results. The longitude measurement the next day showed a big working error. By regulating the movement in comparison with the silver chronometer, the error was reduced, though the later observations showed that the instrument could not be employed in the measurements entailed in fixing latitude. Glaser did however use the timepiece again, comparing it at every observation with the silver chronometer. However, from the middle of December, this likewise began to manifest greater fluctuations. After this accident on the Ğebl Nuķûm, therefore, the astronomical fixation of positions cannot be regarded with any certainty. The large sextant was ruined as a result of the fall had by those mules bearing the traveller's effects, the accident occuring on the journey between the Wâdî Šéres and Bejt ʿIḍâķe on January 2nd, 1884, as has already been explained in detail in the account of the journey. When he returned to Ṣanʿâ, he was actually presented by the Wâlî, ʿIzzet Paša, very obligingly with a sextant belonging to the general-staff. Neither this nor the small sextant were used on the excursion which followed to Arḥab and Ḥâšid. This was a great pity from the point of view of constructing the map, as for this particular area there are none of the important measurements of angles to be had. The varying observations are due to the rapid traverse of this seditions region.

It is of certain interest to mention the meteorological instruments which were employed by Glaser. They consisted of two, well-tested, ordinary thermometers, one Casella maximum-and-minimum thermometer, a psychrometer and lastly one large and one small aneroid. During the stay in Ṣanʿâ they were in regular use.

As Ṣanʿâ was used as a starting point for the measurements of the interior, the latitude and longitude had to be determined exactly. For this purpose, Glaser had measured a large number of solar altitudes along the

meridian or the next nearest it, thus getting the latitude very exactly. The average error of the results was 9″, which may be expressed in long measure as 280 metres in a N. S. direction. It is of importance to know at which point of the town this fixing was made. Glaser lived at the time of these calculations in a roomy house in the S. E. part of the town, 200 paces north of the southern and 150 metres west of the eastern city-wall. The latitude of this point was fixed as being $15° 22' 46'' \pm 9''$. As the house lay some 280 metres south of the line of latitude running through the centre of the town, 9″ are to be added to this figure. One gets the value of $15° 22' 55'' \pm 9''$ for the middle of the town. In fixing the longitude of Ṣanʿâ there are several calculations to be considered : on two occasions, the second satellite of Jupiter coming out of the planet's shadow, two measurements of the distance between the moon and Jupiter, and finally an obscuring of stars caused by the moon. Only the last observation could guarantee an exact longitude difference. From the sketch which refers to this, it is undoubtedly a question of the star of second greatness (β-Scorp.) the entrance and exit of which were due on February 1st. As there was on the same day a fixing of the time from a large series of corresponding solar altitudes, it allows the value obtained from this observation to be checked, showing therein a deviation of hardly more than $1^{sec} = 15''$. The result gave $2^h. 56^{min} 48.1^{sec} = 44° 12' 2''$ for the dwelling-house, or $2^h. 56^{min} 45.3^{sec} = 44° 11' 20''$ east of Greenwich for the centre of the town. The other positions determined astronomically at Ṣanʿâ were fixed by the method employing the chronometer. In the longitude measured on November 15th, 1883, before the damaging of the gold chronometer, there is an error of no more than $5^{sec} = 1\ 1/4'$. The later longitudes determined with the silver chronometer cannot be safely taken as having an error less than $10^{sec} = 2\ 1/2'$.

The careful angle-measurements were made whenever a point afforded a good view over the surroundings. The exactitude of these operations is of acknowledged value. The mirror sextant gave readings to within 5″. Everything was estimated by the explorer to be within 1″. On the occasion of the measurements on the Gebl Ḥaḍûr eš-Šêḥ, he of course explained that another correction had to be made, namely that all the

readings of angles made since the beginning of the individual journey had to be corrected to the extent of - 3′[1]. He said on the Ḥuṣn Ṯlâ on December 5th, 1883: "An index-error must be assumed for all angle-measurements, namely a correction of - 3′"[1]. These assertions considerably diminish the degree of accuracy. Since, however, the drawing of the map can hardly be brought down to within 3′, the reliability of this quantity was very valuable and suffices for the carrying out of the map-work.

The azimuthal measurements were made with an ordinary magnetic needle. The type of compass Glaser used, cannot unfortunately be ascertained. Reading was done from North through East to South, and then through West once more to North. These measurements are not so good as those already described for the sextant. They contain errors of several degrees. At many points the errors are very bad indeed. Then came the thought that the iron objects being carried might have exerted a diverting force, especially could it have been the revolver. This assumption could naturally not be proved. The declination at that time in southern Arabia was a westward one, and approximately only 1°, and this made very little impression on the magnitude of the error. To be regarded as sources of error are also the often unreliable statements made by the various authorities concerning the names of the places in question. Several times Glaser was not able to learn the names of points which he could see. In such cases, these were of no value to the making of the map. The second co-ordinate in the determination of positions by these measurements, the linear distance, is to the credit of the explorer. It frequently shows inaccuracy. It is usually given in kilometres. At the first however it was given in measures of time. The route had to be measured in the unit distance covered by the mules in one hour. An average performance was reckonned to be 6 km. This corresponded to the value for travel on foot. Because the azimuthal measurements were the easiest to make, Glaser carried them out at every resting point on the journey. Apart from the description, these were

[1] *Geographische Forschungen im Jemen,* p. 62.

the actual means of fixing the relationships between the individual objects, on the Arḥab and Ḥâšid excursion, as the sextant had been broken previously on the Ǧebl Miswer.

At the beginning of the map construction the question of the choise of projection had to be considered. It was obvious however, that owing to the comparatively small size of the region and its position in the equatorial zone, there would be very little difference between the various projections, with the drawing on the scale of 1:100.000. The rectangular map-sheet was measured out only for the construction. This is easy to do, and there is a minimum distortion to the east and west of the northern and southern margins for regions near the equator. That part of Yemen in question lies between 43°30′ and 44°20′ E., and between 15°10′ and 16°10′ N. 15°40′ was selected as the fixed parallel, correct for contact with the lines of longitude. As one degree of this amounted to $2 R \pi \cos \gamma \; 1/M$, the value was obtained of 1070.52 mm. or 17.842 mm. for one minute of longitude. So that the map should not be obscured by an altogether too closely drawn graticule, lines were drawn at intervals of 5 to 5 minutes. The distance between the meridians shown was therefore 89.21 mm. As these were correct for longitude, the value of the corresponding parallels amounted to 92.65 mm. The graticule for a conical or Bonne's projection would be the same. The meridians from the southernmost to the northernmost parallel converge then only 0.4 mm. The curvature of the parallels is likewise small. A point was selected on the parallel (15°40′), by means of the rectangular coordinates, obtaining, with the assumption of an angle of 30′ at the apex of the contact cone, the value: $x = 1982.1$ mm. and $y = 11.357$ mm., thus giving a vertical divergence of only 1 cm. for a distance of about two metres from the centre meridian. This small amount is of no account in the drawing, and the net of the rectangular construction is again visible.

After working out the degree net, the 13 astronomically fixed points were put down on it.

The next thing was to obtain as many fixed points on the drawing-sheet as possible with the help of the angles measured with the mirror sextant. The estimates scattered about in the manuscript were first

gathered together, and then the rays corresponding to the sides of the angles drawn in with lead-pencil. The idea of finishing quickly with this part of the work, proved erroneous. As explained in the introduction, the astronomically fixed points could not be used as vertices for the rays radiating from them. The angles between these fixed points a diminishing worth in comparison with those measured by the sextant. There is also this about some of the contrasting objects in the statement of the angles, e. g. a mountain is set from one of these points with the determined value of the angle, into relationship with some of the others, then it does not lie on the same point on the drawing sheet. After going through the matter very thoroughly it was decided not to neglect the angle values, as they were carefully collected, and to alter the astronomical estimates to some extent. Before the end could be achieved of bringing into harmony all the numerous angles criss-crossing over the drawing paper, there had to be a very strict and patient trial made. When all the measurements had been nearly realized, once more a value was obtained which did not fit. The task was, however, at last brought to a successful close, and the exact determination obtained of all the positions, of which at least two points had been actually visible ones.

The construction of the angles was done with a metal protractor with a radius of 10 cm. and a division as fine as 1/2 degree. The lines marking off the subdivisions were cut into the metal, and therefore estimates could be made well up to 5′. This accuracy in drawing was especially valuable, as there were frequently observations of mountain-peaks set far apart, and quite a small error in the angle would have caused a considerable inaccuracy in their positions.

A description of the details of the construction would take too long. One difficulty may be mentioned, however. The eastern region marked by Kaukabân, ʿAmrân and the Ǧebl Dîn, was not connected up with the neighbourhood of Ḥage and Koḥlân to the west by sighting rays, as the great Ǧebl Maṣânaʿa reared up between them. Only by means of a roundabout way via a point lying far to the north, could the regions visited in the west be linked up with the net of rays in the east. The great Ǧebl Šahâre was observed from the Ǧebl Ḥaḍûr eš-Šêḫ and the

Ḥuṣn Ṯlâ. The point of intersection of the sighting rays of the small angle gave its position. The centre also of the town of the same name as the mountain cited, was gauged from the Ǧebl Ḍîn. Unfortunately there was missing a sighting line for the last point, even from the objects already fixed in the eastern region. There were only observations rays coming to it from places not yet fixed in the west. I had to begin again trying to change the astronomic positions. Finally, the problem here was solved and a very fine conformity between all the angle values was obtained. Similarly a satisfactory checking up was obtained with the very steep mountain-peak of Ṣaʿda, lying about 80 km. north of Sûda. Also correspondence to the eastern regions was at last achieved by way of the Ǧebl Ḥaḍûr Nebbî Šuʿaib, the highest group of mountain of Yemen, gauged as well from the eastern part as from the western part of the Ǧebl Maṣânaʿa. To get this, the astronomical figures had to be reduced, far more as was the case in the eastern half. That is due to the fact because, as has already been explained, the measurements made then with the silver chronometer had, from mid-December, 1883, been showing serious fluctuations. The figures for the latitude obtained at that time also are not up to their usual, former accuracy. The very worst errors were made on the Ǧebl Bejt Fâis. Its latitude as fixed by Glaser was 15°30′15″, and that of the Ḥuṣn Ṭawîla, 15°30′22″. According to this, Tawîla would have been somewhat to the north of the Ǧebl Miswer. In reality, there stretches between the two points, the vide wâdî Lâʿa, which has a transverse measurement of about 5″ of latitude. This gross mistake can only be explained away by the fact that the solar noontide altitudes must have been made on the Ǧebl Bejt Fâis with the small sextant, and therefore cannot be expected to have any high standard of accuracy. Furthermore, the figures for the latitudes of Ḥaǧe, Ḍofîr and ʿAffâr exhibit greater inaccuracies. Glaser was fully aware of this himself. In the "Provisional sketch-map" drawn by him, the positions of the just mentioned places did not coincide with the astronomical determinations. So that this part of the sketch-map could be executed, he had, after the description of the country in his journal, to make the necessary alterations in the astronomically obtained figures.

To show how much the fixed points had to be changed and how far

they were from the original estimations, the following table of comparison has been arranged :

	ORIGINAL FIGURES.		CORRECTED FIGURES.	
	LONG.	LAT.	LONG.	LAT.
Ṣanʿâ	44° 11′ 20″	15° 22′ 55″	44° 11′ 20″	15° 22′ 15″
ʿAmrân	43 56 8	15 40 38	43 55 30	15 40 42
Lômî	43 54 23	15 51 36	43 54 35	15 51 12
Ḳarn el-Jahûdî	43 48 21	15 54 39	43 49 48	15 54 8
Sûda	43 46 39	15 57 57	43 45 55	15 58 40
Ǧebl Ḍîn	44 1 56	15 36 40	44 1 46	15 36 56
Kaukabân	43 53 59	15 31 42	43 53 5	15 30 56
Ṭawîla (Ḥuṣn)	43 44 41	15 30 22	43 41 47	15 29 58
Ṯlâ	43 52 38	15 35 19	43 52 46	15 35 28
Ǧebl Ḥaḍûr eš-Šêẖ	43 49 50	15 36 35	43 49 26	15 36 32
ʿAffâr	43 35 45	15 48 17	43 39 45	15 47
Ḥaǧe (Ḳaʿla)	43 32 29	15 42 31	43 34 20	15 40 40
Ḍofîr (Ḥuṣn)	43 31 50	15 46 35	43 33 33	15 45 12
Ǧebl Bejt Fâis	...	15 30 15	...	15 36 15

The largest alterations in longitude therefore are in the position of ʿAffâr and Ḥuṣn Ṭawîla, with 4′ and 2′54″, or 7.1 and 5.2 km. extra respectively. The biggest changes in latitude figures comes in the case of Ǧebl Bejt Fâis and Ḥaǧe, with 6′ and 1′51″, or 11.1 and 3.4 km. difference respectively.

A number of mountain summites observed fall outside the area of the actual drawing. Their positions have been indicated by the directions of the various rays, and the marginal names. An important aspect was that occasionally, one and the same object, observed from different points, had been given various names, and further, that many points had got different names than is actually the case. This is explained by the fact that the natives questioned by Glaser were themselves often not very closely acquainted with the more distant regions. There was only one way of dealing with this matter. In the tabulated lists, where names were incorrect, the true ones have been substitued, being put opposite the corresponding figures for the angles.

In this way, then, a large number of the fixed points were entered into the drawing. The actual details of the map were easily fitted in

after this between these points. It was done in chronological order, *i. e.* each of the three chief expeditions from Ṣanʿâ was examined in turn for its geographical material. Every fact, no matter how related to the topography of the country, was represented on the map. The numerous azimuthal measurements made with the magnetic needle at each resting point, were important. Although not of particularly reliable accuracy, as already explained, they were, nevertheless, a useful means of help. Useable figures were obtained by comparison between the individual observations.

A valuable addition to the measurements and description is the large number of sketch-maps scattered throughout the notes. Thus, a clear picture of the regions represented is usually obtained. This was of great importance for the necessary summary survey. Almost all the chief objects seen by Glaser were represented in this fashion. Some give more detail than the description, in fact. To be sure, they show often bad distortions, as has already been remarked. This is easily understandable, for all of them were eye-sketches. They have therefore to be considerably corrected from the mathematical estimations. On often the country is very finely portrayed by line-sketches. Unfortunately, there were not really full specifications for putting into the map on the scale of 1 : 100.000 for a relief. There were not sketches for all the regions, and those existing were not all of the same standard, as far as the treatment of the landforms was concerned. The remarks about the terrain included, it is true, a great deal, but they are not full enough to get a true idea of the land surface in every detail. This cannot be avoided, and an attempt will be made to get a fairly good conception of the structure of this strange country by means of various figures and positions of the place names. A problem arisises as to how the origin of the many dry valleys, known as wâdîs, is to be explained. Actually in all of them a stream flow appears following heavy rain-showers. It soon disappears into the sand, however, after the cessation of the rain. Only a very few streams withstand the drought. These are, almost without exception, in the western parts subject to the sea winds. Nevertheless, even those streams carrying water for but a short period have been represented by continuous black lines. What is shown on the map,

therefore, is what would occur if there was a heavier precipitation over the whole region. Thus the numerous valleys of the deeply incised landscape are presented at the same time as the temporary flows. It may be remarked here, that in the main valleys, such as the Ḳâʿa el-Baun, the tributary valleys do not reach up to the main wâdî course. The small streams issue in mere trickles, and only enter the main stream in the rainy season. In these comparatively few cases alone, then, do watercourses not represent also the existence of valleys.

Naturally, those regions lying close to the routes receive the most exact and detailed treatment. There are but few gaps left, for enquiries were made concerning such areas useful to this purpose. In the marginal regions, and where no closer accounts are forthcoming, there were marked in the streams occuring in Glaser's "provisional sketch-map", which will be discussed more carefully later. In this respect, Glaser's own copy is being followed. This is very useful, because it carried in the margin Glaser's own notes, particularly relating to the topography of Arḥab. Furthermore, subsequent entrances were made on the map by him. Thus, further additions were to be had.

There are some words to be said at this point regarding the signs and lettering used. There are not many of the first to be noted. Small villages and farms are marked by a small ring, larger settlements by a thicker circle containing a dot. An attempt was made to show the towns by means of boundary lines and hatching, based on the details of Glaser's description and sketches. The points at which the sighting rays intersected were marked by a full circle. The frequently occuring ruins were given their corresponding symbol. Mountain-peaks and the crests of the many volcanic hills had the symbol of a triangle containing a dot. Several kinds of characters were employed for the lettering, and the meaning of the various objects represented by various sizes and thicknesses of lettering. This is clearly seen on the map. The place names were always written straight across the map, the river names following the direction of the courses. In this way, the positions also of the mountain names are to mark its running and the region names their extent. Lastly, an interrupted black line was employed to mark the routes followed by the expeditions.

This, briefly, comprises the mapping entailed in the most accurate cartographic picture in existence of that part of Yemen lying N. W. of Ṣanʿâ. The profitable explorations of Glaser are to be thanked for it. The comparison with the existing maps will be dealt with in the next chapter, and also what improvements could be made and what defects could be removed. The map is distinguished from all others by its wealth of content. In many points it is crowded with detail. It may be further remarked, that the marking of positions between the various objects corresponds on the average to reality. Only in the regions distant from the routes it is this not always the case. This has been explained before. The like is to be said where the mountains are represented only by means of their names. A scientific traveller can therefore still regard N. W. Yemen as a fine ground for further enquiry. In general, however, this region can now be added to the best known parts of southern Arabia, and the map production may be ranked as the cartographic representation of the same that contributes most to its orientation.

NOTES FOR THE ARABIC MAP.

So that the cartographic results might be of the highest possible value to the Arabic World, the author of this thesis had early conceived the idea of an edition of the map in Arabic. In this way, at any rate, a part of southern Arabia would be mapped in the actual script of the country. These thoughts were strengthened by the consideration that, up to the present, there has been no exact map of Yemen on a larger scale in Arabic characters.

So that this new map might be considered correct by the philologist, the names were throughout entered in the correct phonetic transcription. As the basis thereof, the scientifically incontestable facts, gathered by Eduard Glaser on his explorations, were naturally brought into use. His accounts are at the same time the official phonetic notations and therefore particularly valuable. The pages of his journals are frequently bestrewn with translations of the Arabic place names. They provide an excellent means of checking-up. The transcription of the place names

into Arabic script was carried out with the constant guidance of Professor Dr. Adolf Grohmann of the German University of Prague. He rendered a very great service in this respect.

The Arabic edition of the map was executed likewise on the scale of 1 : 100.000. The graticule and drainage-net were reproduced entirely from the first map. Some of the mountain and place names had to be omitted. Since the Arabic characters take up a greater amount of room, in view of the fact that they are very sprawling, it would have made the lettering altogether too cramped. This was the case only at some points, for example around Kaukabân. On the first map, various symbols were employed to represent various natural phenomena. This was not reproduced on the Arabic edition. As on the first map, the sizes of the lettering were used to distinguish between objects of the same kind but of varying importance. To get over this problem, at least in part, the author decided to draw the Arabic map with red and black colouring. In this way, black was used to represent all the physical features (e. g. names of rivers and peaks), while red was reserved for all those features in any way connected with the human geography. Thus place names appear in red. Further, Eduard Glaser's expeditionary routes were marked on by means of a red line. For reproduction, there had to be two printings, one for the black and one for the red names. Particular attention was given to accuracy of drawing. All wants of precision were coming to light by the super-imposition of the two sheets. A village might easily have been mapped as lying on the left-hand side of a wâdî, whereas in actuality it lay on the right-hand side. In order to avoid an ugly and blurred drawing, red and black lettering were never allowed to coincide. This object was reached only after laborious work. The greatest difficulties were encountered by the author in correctly reproducing the beautifully flowing nature of the Arabic characters. Again and again the work had to be restarted, until finally the result appeared to be in some measure presentable. Perfection of shape in the lettering, obtained through the agency of an Egyptian map-production, which served as an aesthetic standard, has hardly been attained. The aim, however, that the map should serve as an exact and really legible representation for the inhabitants of the East in the native script, has been fully achieved.

CRITICAL COMPARISON OF THE MAP

WITH

(*a*) GLASER'S PROVISIONAL SKETCH-MAP

(*b*) THE ENGLISH MAP PRODUCTIONS

(*c*) THE REMAINING CARTOGRAPHIC REPRESENTATIONS.

In the following pages the chief differences between the map produced and the existing representations of the region in question will be presented and some of the most offensive errors in the latter explained.

Firstly there we are dealing with Glaser's own "Provisional sketch-map of part of Eduard Glaser's journeys in Yemen, October 1883-March 1884 and the end of April, 1885". They appear as a supplement to the author's essay: "Von Ḥodeida nach Ṣanʿâ", in Petermanns Geographischen Mitteilungen, annual series 1886, 1 : 500.000. Presented in it, as the title suggests, are firstly the regions with which we are concerned, and secondly those regions touched on the second journey from Ḥodeida to Ṣanʿâ. It includes a classification of degrees, brings in the most important localities investigated by the author, and includes in fact a good characterisation of the country as obtained from further discussion. In general, it is very well presented. The measurements, sketch-maps and notes had to be used for their place here. As has been explained in a previous chapter, it was only in the western parts that the positions of the astronomically fixed points did not correspond with the amounts measured. So that the construction could be made possible, Ḥaǧe, Ḍofîr and especially ʿAffâr have been moved considerably to the east. The latitudes were kept approximate however, except on the case of the Ğebl Miswer, which was moved considerably north to its true position. In actuality the values for the latitudes of the three aforementioned places are given too large. On the map produced, some of the regions north-west of the Ğebl Maṣânaʿa are moved approximately 2-3 km. further south in comparison with Glaser's sketch-map. The distance between Ḥaǧe and the Ğebl Miswer is therefore exaggerated in the latter, and the surrounding regions

elongated. This fact, of course, is obvious when this part is compared with the neighbouring regions, where map and sketch-maps largely agree. The head of the Wâdî Benî Ḳudeil thus comes very close to the source of the W. ʿAḳḳâr, where as they are actually a fair distance apart. Evidence of the former assumption is to be found in the remark in the "Geographischen Forschungen", to the effect that the W. ʿAḳḳâr comes from the village of Benî Ḳudeil (p. 67). Even greater uncertainty is shown in the regions east of the Ǧebl Ḏîn. The localities of Bejt Sûʿ, Benî ʿOtbân and their surroundings, which were described in the commencement in the excursion to Arḥab, are shown too far S., in comparison with the western neighbouring areas of Benî Zubeir and Ǧebl Ḏîn. The stream of the Wâdî Ǧabîb goes therefore wrongly to Salm and Makârîb, whereas actually it should turn into the Ḳâʿa el-Aǧma to Ḏarwân and finally into the Ḳâʿa er-Riḳḳa. The drainage plan could not be entered on account of the uncertainty into the sketch-map, and as there was no mention in the remarks relative, it was not shown in this part of the map production. Not actually corresponding to reality are the many small rivulets near Ḥuṣn ʿArûs, which the sketch-map show flowing down from a ridge which crosses the el-Ahǧir country and joins directly with the Ǧebl Ḏulaʿ. This is not the true state of affairs. The positions of the villages south-east of ʿArûs show many inaccuracies. It was too great a task to correct the positions of the cited objects, as they, as well as the cases discussed, are not of importance. It may be mentioned, too, that the routes are shown incorrectly, as the greater part were not entered in at all. This defects can easily be seen by contrasting the map and the sketch-map. Apart from a more accurate fixing of the individual points, the former is far more detailed, and contains many facts presented for the first time.

The most used maps of the region which we are considering, are the official English representations. There are two editions to be considered. The first appeared in 1889 and was completed in 1893, under the title of : *South Western Arabia.* It was published by the Intelligence Division of the War Office on the scale 1 : 633.600. The second was published by the Ordnance Survey in 1915, corrected 1917, on the scale 1 : 235.440. There is not much to be said on the first. Although there is no reference to it, a careful comparison with Glaser's provisional sketch-map

show these to have been used as a basis. In fact it looks as though they were copied in very detail and only given on a different scale. Every stream has the same course. The smallest meander was reproduced. Exactly the same number of settlements were shown, as well as the expeditionary routes with the same incorrect sections. Only the surface receives no treatment. One can see, therefore, with what eagerness the results of the already described explorations were siezed upon by the English. They filled up the previously void maps with a large number of names. The defects, as described in the discussion of the sketch-map above, appear of course also in the English maps. A similar criticism could be made concerning the work published by the Ordnance Survey. For our purpose, the sheets, No. 2—Sanaa, and No. 3—Saada are to be considered. They were produced in a excellent manner. At first sight, the maps appear to be the best possible. One was forced involuntarily to this idea by the appearance of the presentation, seemingly very exact. The landforms were shown by closely spaced horizontal lines. The smallest valley is shown in fine hatchuring and appears really incised. A more exact knowledge of the country soon brings one however to the realisation that it is not well produced from its assumed basis, that the map gives a fantastic picture in many places and that the surface forms are often misrepresented and dont actually exist. Some conclusive examples it may be first noted that the graduation is inappropriate will be given. It is very bad that the latitude should be given incorrectly whereas the longitude corresponds closely to reality. There is a large error in the latitude figures, which amounts to full 10′. The figure for the centre of Ṣanʿâ is actually 15°22′55″, while the English map gives it as 15°32′55″. Surprisingly, the longitude is everywhere correct. This incorrect drawing of the graticule is constant for the whole map, and continues the same on the adjoining sheets. The relative positions of the topographic features are given almost correctly. After a careful comparison with Glaser's sketch-map it was decided that the Ordnance Survey productions had used them as their basis. Of the assumed source there is no mention on the Sanaa Sheet. On the Saada Sheet there appears under the title : From Eduard Glaser's Journey in Yemen, 1883-84. It appears from the courses of the wâdîs and the

other geographical detail that these map productions are only a copy of Glaser's sketch-map on a larger scale. This applies, of course, only to that part of Yemen for which the sketch-map were made. Every name coming in them reappears in corresponding English transcription and often also in the wrong places again. Only places shown on the sketches appear, and none on the maps that are not also in the sketches. The only deviations occur in the north-eastern part. There also occur the greatest errors. Incorrect drawing here gives many names wrong positions.

The more notorious errors can be quickly noticed here. These are largely owing to the fact that the landforms were very simply fitted into the river-net. For example, the broad valley-plain which is shown as going north-east from ʿAmrân, does not do so at all. The word Ḳâʿa meaning plain or plateau, has not been employed at all. By the fact that the hill-crests were drawn closely facing one another and immediately sloping down to the main watercourses, a wrong impression of a valley which has only a narrow bottom is given. The position of the Wâdî Ḍahr north-west of Ṣanʿâ does not correspond to actuality. The village of Ṭaïba is situated west of Rauḍa and not south-west. Similarly, the position of the place called Ḳâbil is wrong. The long village of Ḍulâʿ is south-east of Ṭaïba and not east. It is not the Ǧebl Šemsân but the Ǧebl ʿIram which extends from this place. The Ḳâʿa er-Riḳḳa drainage-system is not complete, and the tributary of the Wâdî Ḫârid is wrongly shown. The river flowing from the Ḳâʿa el-Baun and the Ḳâʿa Ḥais is entirely incorrectly given. Actually, it flows in a general N. E. direction to Ḏî Bîn, turning then as the Wâdî Šwâba towards the east. On the English map, a mighty mountain-ridge bends this wide valley to the east, and in a further part of its course away towards the south-east, separating it from the tiny representation of the Wâdî Šwâba further north. The range mentioned carries the name Ḳâʿa eš-Šems. The latter suggests, as it actually is, a plain, yet by it was actually meant the broad outlet of the aforementioned valley north of Ǧebl Ḍerwe. Almost impossible things have been marked on, too. The representation of the features in the region east of the places of Ḳâʿa el-Baun is frequently quite inappropriate. The relative position of the places

of ʿAmrî, Rûʿ, ʿÁmmed and Benî Maimûn is inaccurate. Benî Mûnis is placed south-west of Ḍarwân and not north-east. Kaulat ʿAsejkir is the name of a hill and not a village. Places north-west of ʿAmrân are similarly wrongly situated. It is especially bad to find Rêde, with the designation Rade, situated considerably south of the Ǧebl Ṣalîl. Actually, it lies north of that mountain. These mistakes must have arisen in the copying and translation of the sketch-map. Otherwise it is in general a good reproduction of Glaser's work. The mistakes already mentioned as being in the one, are therefore also found in the other. In the larger matters, the English map-production is a tolerably true representation of the actual conditions. Its reliable source makes this understandable. The marginal regions, based on unreliable sources, are poorly reproduced. The map must be regarded with disapprobation as the terrain is marked only with the schematic representation of the river-courses.

And now, the remaining cartographic productions. The first map after those of the Middle Ages was a sketch of the whole of Arabia in 1835. It was drawn on the basis of the information gathered and enquiries made by Ritter and Berghaus. Its title is : "Arabia und das Nilland", and was printed by Justus Perthes of Gotha in the Atlas by Berghaus on the scale of 1:4.000.000. One can see from a mere summary inspection that it offers no close knowledge of the topographic features of the country. Its positions are given fairly well. The localities of Ḥaǧe and Ḍofîr are drawn too far north. The beautiful reproduction of the features by hatching affords only a very approximate representation of the true conditions because of the unreliable information.

Only in 1885 did a new map of Yemen appear. It was produced from the results of Renzo Manzoni's explorations by G. E. Fritzsche on the scale of 1:1.000.000. It has the title of : "Carta originale dello Yemen, Roma 1885". As Manzoni visited only the regions lying south of Ṣanʿâ, it brings no additions or improvements to the regions with which we are concerned.

In 1908, there was a map of Arabia published by the Survey of India. It was produced by F. F. Hunter on the scale of 1 : 2.027.525. A new edition appeared in 1916. The author of it later published his notes

concerning it [1]. This may be described as the best representation on a comparatively small scale. It corresponds surprisingly closely to the real state of affairs. One cannot see why it was not made use of in the other English maps which have already been discussed, particularly for those regions which Glaser did not represent in his sketch-map.

In chronological order, next comes the reproduction of the French engineer, M. Beneyton, in relation to the projected railway from Ḥodeida to Ṣan'â and thence via Ta'izz back to Ḥodeida. In preparation for this line, the country was measured up, and illustrations were drawn for foundations. The map is on the scale of 1:250.000. It presents a very good idea of the country. From Ṣan'â north-west, only the country along the line from that place to 'Amrân is shown. The topography as represented for this region corresponds almost identically with Glaser's account. A bad mistake is the incorrect position of 'Amrân and Benî Zubeir relative to the Ǧebl Ḍîn. The work was not printed. The manuscript is deposited with the Royal Geographical Society in London.

In 1913, a production, accompanying his book [2], appears, done by Walther Schmidt, under the title of: "Jemen, Gebirgsbau und Flussystem". The map scale employed is 1:1.000.000. The regions with which we are concerned are also dealt with by him. Hunter and Glaser appear to have been made good use of, though the map shows many inaccuracies as compared with their productions. There is no river-course running to the east south of the Ǧebl Ḍîn, and Šibâm is shown to the north-east and not to the north of Kaukabân. The naming is wrong here and there. The hatching and brown layercolouring are well done considering the smallness of the scale. On the whole, it corresponds to the true conditions.

A map was published by the Turkish General Staff on the scale of 1:250.000, which also included the regions north and north-west of Ṣan'â. The lettering was done in Turkish. This maps gives a very

(1) F. F. Hunter, *Reminiscences of the Map of Arabia and the Persian Gulf.* Journal of the Royal Geog. Society, 54,1919, p. 355.

(2) Walther Schmidt, *Das südwestliche Arabien. Angewandte Geographie.* I. Series, No. 8. Frankfurt a./M. 1913.

good conception of the relief. As to actual details, there can be many improvements. On the whole, however, it is accurate, and can be regarded with full authority as the best representation of the terrain of the north-west Yemen. In general, there is one good comparison to be made with Glaser's accounts.

In January 1926 there appeared the 'Aden Sheet of the International One-in-a-million, published by the Geographical Section of the War Office in London. It does deal with the regions in which we are interested. A real relief picture is obtained by the use of various layer colours. There are no actual improvements on earlier productions on this scale. It includes a great number of place names. Their transcription is however often entirely wrong. In this respect there is frequently hardly any likeness between this and the other productions. There are many inaccuracies in the positions of the varies places.

All the numerous maps and sketches included in geographical works about Arabia are on a small scale and therefore offer no new contributions to the topography relative to that part of Yemen with which this thesis is concerned. This is also the case in all the atlases, including the hand-atlas by Stieler. In this Arabia is shown in the 10th edition on Sheet 66 on the scale of 1:7.500.000. Only a few places could be marked and the relief rendered schematically.

In conclusion may be discussed the cartographic results of the last journey of exploration made by the two Germans, C. Rathjens and H. von Wissmann. As a result of this, an exact town-plan of Ṣan'â on the scale of 1:13.000 and a sketch-map of the surroundings of the town on the scale of 1:100.000 were published [1]. These must be especially noted.

The actual cartographic results of the expedition are recorded on three valuable map-sheets. These are part of the 3rd volume of the "Rathjens, v. Wissmann, Südarabien-Reise" [2]. From our point of view only the Ṣan'â sheet is of use. The Explorers were well equipped for carrying out the

(1) Supplement to the essay by C. Rathjens and H. v. Wissmann, *Sanaa. Eine südarabische Stadtlandschaft. Zeitschrift der Gesellschaft für Erdkunde in Berlin,* 1929.

(2) *Abhandlungen aus dem Gebiet der Auslandkunde,* Vol. 40, series B Vol. 20. Hamburg 1934.

work of the expedition. The measurements could be very well completed and corrected by means of the extensive photography. Through the great kindness of Dr. Adolf Grohmann, they were able to avail themselves of the knowledge contained in the still unpublished journals of Eduard Glaser. These latter were used to a very large extent. The actual observations, together with the careful measurements, which were evidently from Glaser's sketch-map, serve as a basis for the account of the region north-west of Ṣanʿâ. All the extensive material in descriptions, enquiries and sketch-map has been used. However, Glaser had to be exclusively used for the regions of Kaukabân, ʿAmrân and Wâdî Ḍahr and the Arḥab country. By means of his wonderful topographic account the two explorers were able to form a fine cartographic picture also of those regions shown but not actually visited by themselves. The drawing of the positions of the individual points shows no or little error. The reproduction reaches somewhat to the north of ʿAmrân and is bordered on the west approximately by the Ǧebl Ḥaḍûr eš-Šêḫ. A good idea of the country can be obtained. Relief is shown by brown form-lines. Numerous mountain ranges are shown. The topography is brought out much more thereby. The names unfortunately are not given in the modern transcription. That is the one notable mistake. With its beautiful reproduction, the map creates a considerable impression. With its large scale (1:100.000), its wealth of detail and the accurate comparative positions of the topographic objects, it is easily the finest map production of the immediate surroundings of Ṣanʿâ.

As has been shown, in comparison with the new map, all the earlier maps show errors, which on behalf of Glaser's researches could be mostly corrected. Apart from the work of Rathjens, v. Wissmann, which serves only for the south-eastern part, it is also the only reliable production for the country lying north-west of Ṣanʿâ. It is specially to be noted that, in the transcription of the Arabic names special attention was given to the employment of the international consistent phonetic lettering. The philologist and archaeologist will not be losers by a study of the map and it is to be hoped that they will find there many a hinting.

CONCLUSION.

The importance of Eduard Glaser to the geographical knowledge of southern Arabia.

Although Eduard Glaser was chiefly of importance to archaeology, he was nevertheless of valuable service to the realm of geographical science. This is repeatedly obvious in the preceeding chapters of this treatise. The more exact knowledge of southern Arabia, particularly of the regions around Ṣanʿâ, traces back to him. He was the first explorer to penetrate the previously entirely unknown regions of Arḥab and Ḥâšid. On his journeys, he kept an eye open for everything. This explains the wealth of detail contained in his journals in relation to the various branches of science. Plant life particularly aroused his interest. That Glaser should have produced such fine results is explained by the fact that, more than any of his predecessors, he had an intimate knowledge of the oriental mind, manners and customs, speech and religion of the Arabs. He many times, indeed, formed friendships with the natives, and was received as a welcome guest by them. This was achieved by his knowledge of mankind, his wonderful nack of knowing what to do in the given circumstances. Without the confidence of the natives he would have been able to carry out his valuable observations on the topography and physical geography of the regions visited, only with great difficulty. It is a pity that Glaser himself did not carry out a large map of south-west Arabia. His ability would have fitted him for this task before all others. His personal grounding in the knowledge of the country would have made it much easier than for a later worker using his accounts. This task was frequently commenced. It was not however completed. Probably he was faced by difficulties in the execution of the work and gave it up prematurely. His undeniably service remains, nevertheless in having accumulated so much material as to permit the construction of an exact map of at least one of the regions visited and to form the basis of later representation of the geographical knowledge of north-west Yemen from his accounts. In his capacity of explorer, therefore, Eduard Glaser merits a first-class position.

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APPENDIX [1].

1. INDEX OF EDUARD GLASER'S WRITINGS.
2. LITTERATURE CONCERNING SOUTH-WEST ARABIA.
3. TABLES OF THE ANGLES MEASURED WITH THE LARGE SEXTANT ON THE FIRST EXPEDITION [2].
4. ALPHABETICAL INDEX OF ALL THE NAMES WHICH APPEAR ON THE MAP ACCORDING TO THE GEOGRAPHICAL POSITIONS.
5. ALPHABETICAL INDEX OF ALL THE NAMES OF PLACES WHICH APPEAR IN THE TEXT.
6. GENERAL INDEX (INDEX OF PERSONS AND THINGS).

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[1] The appendix has not been included for the registration.

[2] In the tables, the values are not those read off with the sextant, but those which have been corrected. As the seconds have not been used in the actual drawing, the figures are given to the nearest minute. The correction of the figures by -3′, as suggested by Glaser, appears as an amount varying between-2′30″ and -3′30″ therefore.

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TABLES OF THE ANGLES MEASURED

WITH THE LARGE SEXTANT ON THE FIRST EXPEDITION.

SÛDA.

GOVERNMENT BUILDING.

Ḍofîr and el-Ḳâre	74° 10′
Centre of ʿAffâr and el-Ḳâre	60° 22′
Northern peak of the Ǧebl Miswer (Ǧebl Mudmâr) and el-Ḳâre	50° 14′
Southern peak of the Ǧebl Miswer (Ǧebl Rumeiḥ) and el-Ḳâre	46° 05′
Ǧebl Ḥáram and el-Ḳâre	100° 02′
Koḥlân and el-Ḳâre	46° 44′
Highest point of the Ǧebl Milhân and el-Ḳâre	66° 49′
Actually, the Ǧebl Ḥfâš was measured.	
Ḍofîr and Ḥabûr	100° 36′
— Ǧebl Ǧemîma	63° 43′
— the town of Šahâre	119° 31′
Ḥabûr — —	18° 43′
Ṣaʿda — —	25° 23′
The tower of Ḳumre and el-Ḳâre	27° 03′
— the Ḳassaba Ḳaranṭel	29° 29′

ḲASSABA ḲARANṬEL.

The Ḥuṣn of Sûda and the town of Šahâre	39° 00′
— — — centre of the town of Ḥabûr	20° 02′
— — — Maflûḳa Ṣaʿda	65° 59′
El-Ḳâre and the most south-western point of ʿAffâr	56° 02′
The Ḥuṣn of Sûda and the most south-western point of ʿAffâr	85° 13′

GEBL ḌÎN.

The village of Benî Zubeir and ʿAmrân	43° 51′
— centre of the town of Ṯlâ and ʿAmrân	43° 32′

Peak of the Ǧebl Ḥaḍûr eš-Šêḫ and ʿAmrân	35° 10′
The town of Sahara and ʿAmrân	27° 35′
Kaukabân and ʿAmrân	67° 50′
Ḥuṣn ʿArûs and ʿAmrân	81° 22′
Ǧebl Radmân Ḥaime and ʿAmrân	97° 01′
Eastern peak of Ǧebl Ḥaḍûr Nebbî Šuʿaib and ʿAmrân	112° 30′
The centre of the mountain of Kaukabân and the centre of Ṣanʿâ	90° 21′
— — Ǧebl Kánin and Kaukabân	87° 48′
— — — Barâš —	97° 57′
Ǧebl Barâš and a mountain, lying west of the Ǧebl Darb Ḥaulân	20° 46′
— Ǧebl Darb Ḥaulân	23° 42′
— the highest point of the Ǧebl Lauḏ	26° 19′
— — two highest peaks of the Ǧebl Saraʿ or Ḥarîb Nehm	38° 30′ and 40° 10′
— Ǧebl Ḳaṭab Nehm	57° 02′
Ǧebl Barâš and Ǧebl Ḥarîm Nehm	63° 40′
Ǧebl Ḍî Bîn and ʿAmrân	65° 57′
The mountain actually observed is really called Ǧebl Ḍerwe.	
The highest peak of the Ǧebl Nâʿaṭ and ʿAmrân	73° 24′
The mountain observed has the name of Ǧebl Kâniṭ.	

ǦEBL NUḲÛM.

VIEW POINT AT THE NORTHERN HEAP OF STONES ON THE WESTERN SIDE OF THE RUINED TRIANGLE.

Highest peak of the Ǧebl Saraʿ (Harîb Nehm) and Ǧebl Ḍîn	95° 15′
The mountain of Ḥarîb (or properly Saraʿ) and Ǧebl Ḍîn	100° 26′
Darb Benî Gebr and Ǧebl Ḍîn	119° 12′
The tower of the citadel mosque of Ṣanʿâ (also the dwelling house of the explorer) and Ǧebl Ḍîn	48° 55′
Ḥuṣn Ṯlâ and Ǧebl Ḍîn	17° 57′
Ǧebl Ḥaḍûr eš-Šêḫ and Ǧebl Ḍîn	19° 51′
Kaukabân and Ǧebl Ḍîn	28° 16′
Ǧebl Radmân Ḥaime and Ǧebl Ḍîn	50° 11′
Eastern peak of the Ǧebl Ḥaḍûr Nebbî Šuʿaib and Ǧebl Ḍîn	66° 30′
— — — — — Kánin	99° 02′
Ǧebl Barrâš and Ǧebl Ḍîn	127° 21′

KAUKABÂN.

THE VIEW POINT WAS THE DWELLING HOUSE OF THE EXPLORER, SITUATED FAIRLY NEAR THE CENTRE OF THE TOWN.

The eastern peak of the Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Nuḳûm	47° 16′
The western — — —	52° 16′
Ğebl Ḏîn and Ğebl Nuḳûm	58° 17′
Ḥuṣn of Ṭlâ and Ğebl Ḏîn	56° 41′
Ğebl Ḏî Bîn —	31° 40′
The mountain actually observed is really named the Ğebl Kânit.	
Ğebl Ḥubbe or Ḏurb and Ğebl Ḏîn	6° 03′
The highest peak of the Ğebl Maṣâna'a and Ğebl Ḏîn	87° 06′
Ğebl Radmân Ḥaime and Ğebl Nuḳûm	58° 15′
Ğebl Ḏâmir and Ğebl Nuḳûm	72° 54′
The Ğebl 'Âniz was actually measured.	
Another mountain lying closer than the last two mountains named, and Ğebl Nuḳûm	80° 49′
Ğebl 'Âniz with a village and Ğebl Nuḳûm	86° 35′
This is really the Ğebl Šibâm Ḥarâz.	
The highest part of the Ğebl Ḥarîb and Ğebl Nuḳûm	26° 46′
A second peak of the Ğebl Ḥarîb and Ğebl Nuḳûm	25° 36′
The three peaks of the mountain of Ḥaulan and Ğebl Nuḳûm	13° 24′ 15° 16′ 16° 48′

ṢFÂ ḲAḪLÎL.

ROOF OF THE SEMSERA.

Eeastern peak of the Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Barrâš	34° 25′
Western — — — —	37° 54′
Ğebl Kánin and Ğebl Barrâš	18° 20′
Eastern peak of Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Nuḳûm	33° 01′
— — — Kaukabân	41° 29′
Ğebl Ḥaḍûr eš-Šêḫ and Ğebl Barrâš	81° 11′
— — Kaukabân	74° 54′

ḤUṢN ṬAWÎLA.

Ğebl Rumeiḥ and Ğebl Mudmâr	2° 52′
The angle between the two peaks of the Ğebl Ḥaḍûr Nebbî Šu'aib	2° 41′
The eastern peak of the Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Ṣelfî	43° 50′
— — — — Rumeiḥ of the Ğebl Miswer	147° 13′

The eastern peak of the Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Šibam Ḥarâz .	48° 10′
— — — — Ğebl Gésebe..	54° 56′
Actually the Ğebl Masâr was seen.	
Ğebl Mudmâr and Ğebl Ḥfâš	90° 44′
Ğebl Rumeiḥ and the eastern peak of the Ğebl Šahâre, as obtained by later enquiries	18° 00′
Ğebl Rumeiḥ and Ğebl Maḥdad	35° 07′
— — the tower of Bukúr	81° 10′

ḤUṢN ṬLÂ.

Ğebl Ḏî Bîn and Ğebl Ḏîn	53° 05′
In stead of the above, the closer Ğebl Ḏerwe was actually seen	
Ğebl Nâ'aṭ Kânit and Ğebl Ḏîn	41° 13′
The range observed in Ṭawîla, which was taken to be Sûda, and Ğebl Ḏîn.	101° 10′
Actually, Ğebl Šahâre, the western peak.	
Ḥarîm Nehm (also called Zubbet Nehm) and Ğebl Ḏîn	4° 27′
Ğebl Ḥubbe and Ğebl Ḏîn	18° 01′
The centre of Kaukabân and the highest part of Ḥaḍûr eš-Šêḫ	109° 31′
Centre of Ḥaḍûr eš-Šêḫ — — the range thought in Ṭawîla to be Sûda, and therefore actually Ğebl Šahâre	51° 21′
Eastern peak of the Ğebl Ḥaḍûr Nebbî Šu'aib and the centre of the Ğebl Ḥaḍûr eš-Šêḫ	123° 11′
Ğebl Nuḳûm and the eastern peak of Ğebl Ḥaḍûr Nebbî Šu'aib	42° 00′
Centre of Ğebl Kánin and Ğebl Nuḳûm	13° 44′
Ğebl Nuḳûm and A Harîb Nehm	28° 03′
— B —	29° 18′

ĞEBL ḤAḌÛR EŠ-ŠÊḪ.

Centre of the town of 'Amrân and Ğebl Ḏîn	33° 44′
Ğebl Ḏîn and Ğebl Nuḳûm	32° 32′
— peak A of the Ğebl Ḥarîb Nehm	7° 33′
— — B — —	6° 23′
— peaks A, B and C of the mountain of Ḥaulân given in the angle observations	16° 41′ 18° 30′ 20° 18′
Centre of Ğebl Kánin and Ğebl Ḏîn	46° 02′
Ḥarîm (or Zubbet) Nehm and Ğebl Ḏîn	9° 41′
Ğebl Kaṭab Nehm and Ğebl Ḏîn	5° 41′
Eastern peak of Ğebl Ḥaḍûr Šu'aib and Ğebl Ḏîn	68° 05′

Ğebl Ḥubbe (Ḍurb) and Ğebl Ḍîn	17° 30′
The mountain taken as Ğebl Nâ'aṭ (Kânit) from Ṯlâ and Ğebl Ḍîn	41° 23′
Ğebl Ḍî Bîn and Ğebl Ḍîn (actually the Ğebl Ḍerwe was measured in Ṯlâ).	53° 37′
Ğebl Ḍîn and the centre of Kaukabân	59° 03′
— — mountain regarded in the earlier observations as belonging to Sûda. Therefore the western peak of Ğebl Šahâre	104° 56′
Ğebl Ḍîn and Ḥuṣn Ṯlâ	19° 50′
— Ğebl Radmân Ḥaime	73° 02′
The Tihâma mountain Ğebl Ṣelfî and Ğebl Ḍîn	94° 41′
Ğebl 'Âniz and Ğebl Ḍîn	91° 56′
— Benî Mukatil and Ğebl Ḍîn	97° 35′
— Šibâm Ḥarâz —	102° 30′
— Masâr and Ğebl Ḍîn	108° 03′

'AMRÂN.

Observations were made from the government building situated in the centre of the town.

Ğebl Ḍîn and Ğebl Ḥaḍûr eš-Šêḫ	110° 29′
— Nâ'at and Ğebl Ḍîn	81° 43′
— Ḥubbe and Ğebl Ḍîn	41° 32′
Nâ'at and Ğebl Ḍîn	68° 27′
The ruins of Mirḥa on the Hağz and Ğebl Ḍîn	77° 28′
Ruins on the Ğebl Ğennât and Ğebl Ḥaḍûr eš-Šêḫ	97° 58′
A view point almost 2 km. south of Rêde and Ğebl Ḍîn	92° 31′
Rêde and Ğebl Ḍîn	93° 55′
Measured only in that direction. Rêde itself not visible.	
Ğebl Ḍî Bîn and Ğebl Ḍîn. Ğebl Ṣalîl near Rêde is meant	98° 37′
An attempt was made several times later to fix the position of Nâ'aṭ exactly. Glaser gives the final angle between Nâ'aṭ and Ğebl Ḍîn as	68° 20′
Liğâm and Ğebl Ḍîn	67° 08′
The above statement applies also to Liğâm. Actually, the above mentioned Ğebl Nâ'aṭ is really the Ğebl Kânit.	

NEĞRE.

Centre of 'Amrân and Ğebl Ḍîn	122° 49′
El-Kaṣr Ğennât, lying lower down on a mountain slope, has the same angle with Ğebl Ḍîn as 'Amrân.	
Centre of the Bâb el-Mánkaḍe and Ğebl Ḍîn	84° 41′

Amrân and the village of Benî Zubeir	99° 24′
Ğebl Ḥubbe and Ğebl Ḍîn	39° 41′
The ruins on a hill projecting into the Kâ'a el-Baun, called Baḍ'a and Ğebl Ḍîn	93° 36′
Rêde and Ğebl Ḍîn	89° 12′
The adjacent village of Bejt Ša'lal and Ğebl Ḍîn	53° 18′
Bejt Ḍa'wân and Ğebl Ḍîn	57° 04′
el-Wárik —	62° 30′
Bejt el-Gâḍer —	68° 44′
— Si'le —	67° 53′
el-Ḥâit —	66° 49′
Bejt Hárraš —	85° 08′

HÂZ.

Observations from the terrace of the šeiḫ's house built outside the village north-east of the wall.

Ğebl Hadûr eš-Šêḫ and Ğebl Ḍîn	92° 04′
— — Kaukabân	35° 15′
— — eastern peak of Ḥaḍûr Nebbî Šu'aib	110° 01′
— — Ğebl Radmân Ḥaime	89° 31′
— — Ḥuṣn 'Arûs	62° 48′
Ḥuṣn Ṯlâ and Ḥuṣn 'Arûs	59° 09′

RÊDE.

THE HIGHEST PART OF THE VILLAGE.

Kaukabân and Ğebl Ḍîn	24° 50′
Ḥuṣn Ṯlâ —	30° 34′
Neğr — —	28° 16′
Ḥuṣn 'Arûs —	19° 29′
Eastern peak of Ğ. Ḥaḍûr Nebbî Šu'aib and Ğebl Ḍîn	8° 12′
Ḥuṣn Ḍôfân — —	14° 19′
Nâ'aṭ — —	54° 24′
Lômî — —	98° 43′
Lômî and Ğûle	56° 20′
Lômî and Da'ân	11° 27′
Approximate direction of Ẓafâr and Ğebl Ḍîn	141° 40′
As 'Amrân could not be seen from Rêde, that town was observed from a more southern viewpoint. The angle obtained here between 'Amrân and Ğebl Ḍîn was	34° 10′

After returning to 'Amrân, the angle between the above point and Ğebl Ḍîn had the value of	92° 31′
From here the angle between Rêde and Ğebl Ḍîn was fixed as	93° 53′

BENÎ ZUBEIR.

Eastern peak of Ğebl Ḥaḍûr Nebbî Šu'aib and Ğebl Ḍîn	21° 17′
Ğebl Radmân and Ğebl Ḍîn	34° 00′
Ḥuṣn 'Arûs —	45° 02′
Ğebl Ḥarîm Nehm —	87° 20′
Reide and 'Amrân	76° 45′
Nâ'aṭ and Ğebl Ḍîn	138° 56′
Ğebl Ḳaṭab Nehm and Ğebl Ḍîn	81° 57′
Ğebl of Ḥaulân and Ğebl Ḍîn	52° 27′
Kaukabân and Ğebl Ḍîn	55° 24′
Ḥuṣn of Ṭlâ and Ğebl Ḍîn	76° 13′
Ğebl Ḥaḍûr eš-Šêḫ and Ğebl Ḍîn	88° 21′
Ğebl Radmân Haime and 'Amrân	82° 11′
Ğebl Ḥubbe (Ḍurb) and Nâ'aṭ	29° 11′
— and Ḍôfân	31° 11′
— and Ğebl Ḍîn	106° 11′

KARIM.

250 PACES WEST OF THE ACTUAL VILLAGE.

Nâ'aṭ and Ğebl Ḍîn	37° 14′
The 3 already frequently observed mountains of Ḥaulân and Ğebl Ḍîn	2° 37′ 4° 22′ 6° 16′
The 2 peaks of the Ğebl Ḥarîb Nehm and Ğebl Ḍîn	5° 29′ 6° 42′

KOḤLÂN.

THE TOWN'S ḤUṢN.

el-Ḳâre and the Ḥuṣn of the town of Ṣûda	18° 13′
Ḥalḥale and the Ḥuṣn of the town of Ṣûda	34° 56′
el-Ḳâre and the centre of the town of Šahâre	35° 25′
Centre of the town of Šahâre and Ḥuṣn of Ṣûda	17° 16′
Maflûk Ṣa'da and Ḥuṣn of Ṣûda	6° 39′

Ḥuṣn of 'Affâr and Ḥuṣn of Ṣûda	44° 44′
— and Ḳal'a of Ḥağe	81° 21′
— and ez-Zahrein	79° 20′
— and Sûḳ of Ḥağe	82° 22′
— and Na'mân	82° 51′
Ḥuṣn of Ḍofîr and Ḥuṣn of Ṣûda	91° 49′
Centre of Ḍofîr and —	91° 00′
The two peaks of the Ğebl Milhân and Ḥuṣn of 'Affâr	93° 14′ 95° 46′
Ğebl Ḥfâš and —	101° 43′
A peak of the Ğebl Miswer and Ḳal'a of Ḥağe, seen from the Ğebl Rumeiḥ	55° 34′
Highest peak of a mountain connecting with the Ğebl Miswer and Ḳal'a of Ḥağe. The Ğebl Kilâlî was observed	67° 53′
Ḳassaba of Bejt 'Idâḳe and Ḳal'a of Ḥağe	62° 00′
Ğebl Maḥdad and the Ḳal'a of Ḥağe	80° 23′

'AFFÂR.

TOWER OF THE ḤUṢN.

Ḥuṣn of Koḥlân and Ḥuṣn of the town of Ḍofîr	102° 37′
— and centre of Ḍofîr	104° 12′
— and Na'mân of Ḥağe	66° 53′
— and Ṣûk of Ḥağe	67° 42′
— and the Ḳal'a of Ḥağe	68° 32′
— and ez-Zahrein of Ḥağe	70° 12′
el-Ḳâre and Ḥuṣn of Ṣûda	24° 36′
— and Koḥlân	97° 37′
Centre of Šahâre and Koḥlân	25° 56′
Maflûk Ṣad'a and Ḥuṣn Ṣûda. The top of the Ğebl Rumeiḥ was observed	28° 40′

ḤAĞE.

TOWER OF THE ḲAL'A.

Ḥuṣn of the town of Ḍofîr and Ḥuṣn of 'Affâr	47° 02′
Centre of Ḍofîr and —	46° 08′
Centre of Šahâre and —	28° 13′
Highest point of the Ğebl Ḥfâš and the tower of Ḥaddâd	55° 42′
The two peaks of the Ğebl Milḥân and Ḥaddâd	67° 57′ 71° 56′
Ḥaddâd and Ḥuṣn of Koḥlân	90° 57′

Ḥaddâd and ʿAffâr	121° 00′
Koḥlân and the highest point of Ǧebl Miswer (Ǧebl Bejt Fâis)	75° 25′
Western peak of the Ǧebl Šahâre and ʿAffâr	32° 52′

ḌOFÎR.

TOWER OF THE ḤUṢN.

Affâr and the tower of Ḥaǧe	98° 47′
— and Ḥuṣn of Sûda	30° 49′
Centre of the town of Šahâre and Sûda	28° 49′
The highest point of the range of Šahâre and Sûda	34° 04′
Ǧebl Ǧemîma and Sûda	43° 08′
Ḳalʿa of Ḥaǧe and the village of Šemsân	33° 41′
— and the centre of the village of Mabjan	66° 40′

ǦEBL BEJT FÂIS (MISWER).

Eastern peak of the Ǧebl Ḥaḍûr Nebbî Šuʿaib and the Ḥuṣn of Ṭawîla	14° 28′
Ǧebl Ḥfâš and Ḥuṣn of Ṭawîla	80° 38′
Eastern peak of the Ǧebl Ḥaḍûr Nebbî Šuʿaib and Ǧebl Bejt ʿIlmân	51° 26′
Ḳalʿa of Ḥaǧe and the western peak of the Ǧebl Šahâre	38° 38′

ALPHABETICAL INDEX OF ALL THE NAMES

WHICH APPEAR

ON THE MAP ACCORDING TO THE GEOGRAPHICAL POSITIONS.

A	LATITUDES.	LONGITUDES.
Abraḳ	15° 48′	43° 56′
el-Abǧir	15° 28′	43° 51′-43° 54′
Arḥab	15° 37′-15° 56′	44° 13′-44° 15′
Aškâḳ	15° 41′	43° 50′
Azraḳein	15° 25′	44° 12′
el-Azraḳein	15° 30′	44° 8′

ʿA	LATITUDES.	LONGITUDES.
ʿÂdî	15° 52′	43° 47′
ʿAffâr	15° 47′	43° 48′
el-ʿAin	15° 37′	43° 53′
ʿAjâl Sorêḥ	15° 35′-15° 54′	44°-44°6′
el-ʿAkl	16° 6′	44° 13′
ʿAḳabet Bʿ. Abû Murâd	15° 55′-15° 57′	44° 10′-44° 11′
ʿAḳabet Daʿân	15° 50′	43° 54′-43° 56′
ʿAḳabet Ḏânib	15° 52′	43° 55′-43° 57′
ʿAlmân	15° 28′	44° 9′
el-ʿAmaše	15° 59′	43° 43′
ʿÁmmed	15° 36′	43° 58′
ʿAmrân	15° 41′	43° 56′
ʿAmrî	15° 38′	43° 56′
el-ʿAnamî	15° 39′	44° 12′
ʿAraḳe ʿAffâr	15° 47′	43° 40′
ʿAraḳet el-Ḳudeimî	15° 46′	44° 4′
el-ʿArḍa	15° 31′	43° 54′
ʿArḍ el-Kebîr	15° 50′	43° 52′
ʿArûs	15° 29′	43° 54′
ʿAsr	15° 22′	44° 9′
ʿAttâd	15° 58′	43° 44′
ʿAṯṯâr	15° 56′	44° 4′

	LATITUDES.	LONGITUDES.
'Auda el-Ḥimjarî	15° 49′	43° 53′
'Aumara	15° 38′	44° 14′

B

	LATITUDES.	LONGITUDES.
Bâb ed-Derb	15° 36′	43° 41′
Bâb el-Feǧrên	15° 30′	43° 56′
Bâb el-Manḳade	15° 59′	44° 8′
Bâb Menǧel	15° 24′	44° 10′
Baḏ'a	15° 45′	43° 59′
Bainûn	15° 33′	43° 52′
Batûḳa	15° 32′	43° 51′
Bauṣân	15° 41′	44° 18′
Behêle	15° 51′	43° 49′
Bt. [1] el-Aḥraḳ	15° 45′	43° 56′
Bt. 'Adlân	15° 36′	43° 58′
Bt. 'Adrân	15° 23′	44° 8′
Bt. 'Âmir	15° 40′	43° 57′
Bt. el-'Anas	15° 53′	43° 51′
Bt. 'Awwâš	15° 45′	43° 44′
Bt. Bâdî	15° 41′	43° 53′
Bt. el-Barrâdî	15° 35′	44° 13′
Bt. Dafa'	15° 40′	44° 11′
Bt. ed-Dail	15° 28′	43° 56′
Bt. Da'wân	15° 40′	43° 57′
Bt. Ḏânib	15° 51′	43° 57′
Bt. eḏ-Ḏîb	15° 29′	43° 46′
Bt. eḍ-Ḍafîf	15° 34′	44° 7′
Bt. eḍ-Ḍarḥânî	15° 42′	43° 51′
Bt. eḍ-Ḍul'î	15° 41′	43° 59′
Bt. Fâis	15° 37′	43° 39′
Bt. el-Faḳîh Sad	15° 41′	43° 55′
Bt. el-Farwî	15° 42′	43° 42′
Bt. Ǧa'dan	15° 44′	43° 56′
Bt. el-Ġâder	15° 42′	43° 59′
Bt. Ġufr	15° 33′	43° 59′
Bt. Ġuzzî	16° 7′	44° 10′

[1] Bejt.

	LATITUDES.	LONGITUDES.
Bt. Hárraš	15° 51′	44° 3′
Bt. Haudal	15° 31′	44° 13′
Bt. el-Ḥaḏir	15° 50′	44° 9′
Bt. el-Ḥaǧâm	15° 46′	44° 16′
Bt. el-Ḥamûdî	15° 42′	44° 4′
Bt. el-Ḥâriṯî	15° 48′	43° 53′
Bt. Ḥamîs	15° 33′	43° 51′
Bt. 'Idâḳe	15° 36′	43° 42′
Bt. 'Ilmân	15° 38′	43° 47′
Bt. 'Îsa	15° 31′	43° 54′
Bt. 'Izz	15° 32′	43° 52′
Bt. el-Kaulî	15° 43′	43° 41′
Bt. el-Ko'ûd	15° 44′	43° 55′
Bt. el-Kurârî	15° 38′	43° 38′
Bt. Ḳais	15° 48′	44° 16′
Bt. el-Ḳîdalî	15° 52′	43° 52′
Bt. Ḳufâf	15° 52′	44° 3′
Bt. Maḏkûr	15° 30′	43° 44′
Bt. Manṣûr	15° 56′	43° 48′
Bt. el-Marânî	15° 48′	43° 47′
Bt. Marrân	15° 43′	44° 12′
Bt. el-Merḳasî	15° 48′	43° 46′
Bt. Milejk	15° 32′	43° 49′
Bt. el-Mo'ṣâr	15° 45′	43° 55′
Bt. Mudrik	15° 42′	43° 53′
Bt. Mufárraḥ	15° 32′	43° 48′
Bt. Na'am	15° 25′	44° 3′
Bt. Na'âme	15° 18′	44° 6′
Bt. 'Oṯmân	15° 33′	43° 51′
Bt. Ramaḍân	15° 54′	44° 11′
Bt. Rassâm	15° 35′	44° 15′
Bt. Rašîd	15° 32′	43° 51′
Bt. Rejaš	15° 38′	43° 54′
Bt. er-Rubu'aî	15° 37′	43° 52′
Bt. Sî'le	15° 43′	44°
Bt. Sináḥ	15° 37′	43° 55′
Bt. Subáḥ	15° 33′	44°
Bt. Sû'	15° 41′	44° 12′
Bt. Šabân	15° 50′	43° 52′

	LATITUDES.	LONGITUDES.
Bt. Šâjaʿ	15° 39′	43° 58′
Bt. Šaʿlal	15° 40′	43° 57′
Bt. Šaʿṯân	15° 48′	44° 3′
Bt. Šibeil	15° 41′	43° 54′
Bt. Širâḥ Allâh	15° 41′	43° 53′
Bt. Ṣalâḥ	15° 49′	44° 20′
Bt. Ṣeifân	15° 52′	44° 13′
Bt. el-Walî	15° 42′	43° 43′
Bt. el-Wášar	15° 50′	44° 18′
Bt. Wuḥâs	15° 52′	44° 4′
Bt. Zuheir	15° 40′	43° 36′
Benî Aḥmed	15° 57′	43° 46′
Benî ʿAbd	15° 55′	43° 54′
Benî Hohš	15° 47′	43° 38′
Benî Ḥasan	15° 57′	43° 47′
Benî Ḥawár el-Aʿlâ	15° 37′	43° 41′
Benî Ḥawár el-Asfal	15° 38′	43° 41′
Benî Ḥawât	15° 32′	44° 14′
Benî Ḥairân	15° 45′	44° 9′
Benî ʿIzzân	15° 55′	44° 11′
Benî Ḳudeil	15° 45′	43° 50′
Benî Mahdî	15° 39′	43° 40′
Benî Maimûn	15° 36′	44° 1′
Benî Mûnis	15° 33′	44° 4′
Benî Nâʿim	15° 42′	43° 49′
Benî ʿOtbân	15° 42′	44° 10′
Benî Zeid	15° 42′	43° 59′
Benî Zubeir	15° 40′	44° 1′
Berrîš	15° 28′	44°
Bukúr	15° 33′	43° 47′
Burǧ el-Ḥiǧâr	15° 55′	43° 50′
Bustân Buârî	15° 33′	43° 54′
Bustân el-Ḳutn	15° 32′	43° 54′

D

Daʿân	15° 50′	43° 54′
ed-Dâr	15° 30′	43° 46′
Darbʿ es-Sulṭân	15° 58′	43° 45′

	LATITUDES.	LONGITUDES.
Dâr el-Ḥaǧar	15° 28′	44° 7′
Darwân	15° 34′	44° 4′
ed-Derb	15° 37′	43° 51′
ed-Derb	15° 49′	43° 40′
Derb el-Aswad	15° 42′	43° 52′
Derb ʿAmrân	15° 40′	43° 55′
Derb el-Mîdân	15° 43′	43° 52′
Derb ʿObeid	15° 41′	44° 16′
Direʿ	15° 32′	43° 46′
Durûb es-Ṣfâ	15° 42′	43° 45′

Ḏ

Ḏaḥbân	15° 26′	44° 10′
Ḏanûb	15° 44′	43° 32′
Ḏî Bîn	16° 6′	44° 12′

Ḍ

eḍ-Ḍabâʿîn	15° 45′	43° 55′
Ḍaḥjân	15° 53′	44° 2′
Ḍajân	15° 37′	43° 55′
eḍ-Ḍalaʿain	15° 50′	43° 50′
Ḍarafât	15° 46′	44° 12′
Ḍarbat ʿAlî	15° 27′	44° 7′
Ḍarḥân	15° 28′	43° 58′
Ḍêfân	15° 43′	44° 4′
Ḍejân	15° 50′	43° 52′
Ḍofîr	15° 30′	43° 55′
Ḍofìr	15° 45′	43° 34′
Ḍofrân	15° 32′	43° 53′
eḍ-Ḍofrên	15° 56′	43° 51′
eḍ-Ḍubr	15° 52′	44° 9′
Ḍufúr	15° 42′	43° 33′
Ḍulâʿ	15° 25′	44° 7′
Ḍulaʿ el-Ešmûr	15° 42′	43° 44′
Ḍulʿat Sûda	15° 59′	43° 44′-43° 46′

E

Etwa	15° 50′	44° 18′

	LATITUDES.	LONGITUDES.
ʿE		
ʿErḳ	15° 47′	43° 42′
ʿErra	15° 31′	44° 10′
ʿErret el-Baṭṭa	15° 33′	43° 53′
ʿErret el-Ešmûr	15° 42′	43° 47′
ʿErret en-Nahârî	15° 32′	43° 54′
F		
Fiddeh	15° 27′	44° 6′
Fsîra	16° 7′	43° 57′
Ǧ		
el-Ǧaʿâr	15° 42′	43° 42′
Ǧâhilîja	15° 33′	44° 11′
el-Ǧâhilîja	15° 29′	43° 45′
Ǧâif Hamdân	15° 38′	44° 3′
Ǧâif Srêḥ	15° 39′	44° 3′
Ǧauʿân	15° 29′	43° 46′
Ǧaub el-Aʿlâ	15° 46′	43° 58′
Ǧaub el-Asfal	15° 47′	43° 59′
Ǧ.[1] Abû Ḍejbe	15° 53′	43° 52′
Ǧ. Aḍraʿ	15° 49′	44° 6′
Ǧ. Akhûm	15° 52′	43° 50′
Ǧ. ʿAffâr	15° 48′	43° 39′
Ǧ. ʿAjâl Jezîd	15° 49′-16° 2′	43° 54′
Ǧ. ʿAjâne	15° 35′	44° 3′
Ǧ. ʿAmr	15° 44′	43° 33′
Ǧ. ʿAmšî	15° 46′	43° 33′
Ǧ. ʿÂn	15° 30′	44° 6′
Ǧ. ʿAršân	15° 47′	43° 30′
Ǧ. ʿArûs	15° 29′	43° 54′
Ǧ. ʿAwârid	15° 41′	43° 36′
Ǧ. Baḥš	15° 39′	43° 51′
Ǧ. Barrâš	15° 22′	44° 15′
Ǧ. Bt. Bâdî	15° 42′	43° 52′

[1] Ǧebl.

	LATITUDES.	LONGITUDES.
Ǧ. Bt. Fâis	15° 37′	43° 37′
Ǧ. Bt. Ǧâʿî	15° 44′	44° 5′
Ǧ. Bt. ʿIlmân	15° 38′	43° 47′
Ǧ. Bt. ʿIzz	15° 32′	43° 52′
Ǧ. Bt. Ḳadam	15° 41′	43° 41′
Ǧ. Benî ʿAlâ	15° 54′	43° 49′
Ǧ. Benî ʿAlî	15° 57′	43° 43′
Ǧ. Benî Ǧedîla	15° 54′	43° 41′
Ǧ. Benî Ǧeiš	15° 47′	43° 45′
Ǧ. Benî Ṭalḳ	15° 50′	43° 48′
Ǧ. Bûḳâṣe	15° 51′	43° 52′
Ǧ. Dáḳani	15° 36′	44° 7′
Ǧ. Detî	15° 59′	43° 48′
Ǧ. Ḍafʿa	15° 33′	43° 53′
Ǧ. Ḍêfân	15° 43′	44° 4′
Ǧ. Ḍerwe	15° 59′	44° 5′
Ǧ. Ḍîn	15° 37′	44° 2′
Ǧ. Ḍofîr	15° 29′	43° 56′
Ǧ. Ḍufâr	15° 46′	44° 6′
Ǧ. Ḍulâʿ	15° 32′-15° 34′	43° 48′-43° 52′
Ǧ. Ḍurb (Ḫubbe)	15° 42′	44° 6′
Ǧ. el-Feǧrên	15° 30′	43° 56′
Ǧ. Ǧaʿserî	15° 33′	43° 53′
Ǧ. Ǧeber	15° 44′	43° 32′
Ǧ. Ǧebǧeb	15° 38′	44° 8′
Ǧ. Ǧemîme	16° 2′	43° 33′
Ǧ. Ǧennât	15° 42′	43° 54′
Ǧ. Ġurbân	16° 2′	43° 48′
Ǧ. Ġuwâs	16° 4′	43° 46′
Ǧ. Hâgirîn	15° 40′	43° 37′
Ǧ. Hiǧre	16° 1′	43° 47′
Ǧ. Ḥaḏîra	15° 38′	44° 2′
Ǧ. Ḥaḍûr eš-Šêḫ	15° 37′	43° 49′
Ǧ. Ḥaḍûr Nebbî Šuʿaib	15° 17′-15° 19′	43° 54′-44° 1′
Ǧ. Ḥâǧib	15° 28′	44° 9′
Ǧ. Ḥaǧz	15° 38′	43° 53′
Ǧ. Ḥamme	15° 29′	44° 9′
Ǧ. Ḥanâdire	15° 58′	43° 50′
Ǧ. Ḥaumerî	15° 57′	43° 52′

	LATITUDES.	LONGITUDES.
Ğ. Ḥikl	15° 52′	43° 48′
Ğ. Ḥinâḏ	15° 44′	44° 8′
Ğ. Ḥṣwîn	15° 41′	43° 34′
Ğ. ʿIram	15° 28′	44° 4′
Ğ. ʿÎsa	15° 32′	43° 50′
Ğ. ʿIšar	15° 28′	44° 6′
Ğ. Janûr	15° 59′-16° 1′	44° 11′
Ğ. Kâmeʿ	15° 47′	44° 9′
Ğ. Kânit	15° 52′	44° 7′
Ğ. Kilâlî	15° 37′	43° 42′
Ğ. Kšer	15° 52′	43° 47′
Ğ. Ḳâʿa	15° 41′	43° 51′
Ğ. Ḳanâzaʿ	15° 45′	44° 9′
Ğ. Ḳanâzid	15° 46′	44° 8′
Ğ. Ḳaraḏe	15° 55′	43° 52′
Ğ. Ḳunna	16° 7′	44° 14′
Ğ. Lâu	15° 32′	43° 52′
Ğ. Liğme	15° 38′	43° 52′
Ğ. Lubâḫa	15° 32′	43° 53′
Ğ. Mâdir	15° 44′	43° 54′
Ğ. Maḏraḫ	15° 53′	43° 49′
Ğ. Maḥdad	15° 36′	43° 44′
Ğ. Maḥraṯ	15° 41′	43° 33′
Ğ. Maḥratte	15° 43′	44° 10′
Ğ. Maḥwan	15° 44′	44° 9′
Ğ. Maṣânaʿa	15° 34′-15° 39′	43° 44′-43° 48′
Ğ. el-Maṣnaʿa	15° 36′	43° 40′
Ğ. Medaʿ	15° 38′	43° 49′
Ğ. Meḏmere	15° 30′	43° 52′
Ğ. Mîkaʿ	16°	43° 51′
Ğ. Miswer	15° 36′	43° 37′-43° 40′
Ğ. Muḏmâr	15° 37′	43° 39′
Ğ. Muḥawwa (ʿAṣâfire)	15° 46′	44° 5′
Ğ. Nâḳil	15° 28′	44° 6′
Ğ. Naʿmân	15° 40′	43° 34′
Ğ. Neğîf	15° 41′	44° 9′
Ğ. Neğre	15° 37′	43° 32′
Ğ. Nîsa	15° 51′	43° 34′
Ğ. Nuḳûm	15° 22′	44° 14′

	LATITUDES.	LONGITUDES.
Ğ. Radmân Ḥaime	15° 23′	43° 54′
Ğ. Rajânî	15° 32′	44° 1′
Ğ. Rakaṯ	15° 31′	44° 1′
Ğ. Râḳî	15° 38′	44° 6′
Ğ. Rehêḳe	15° 56′	43° 47′
Ğ. Riâm	15° 51′	44° 19′
Ğ. Rubʿa eš-Šarkî	15° 45′-15° 48′	43° 57′-43° 58′
Ğ. Rumeiḥ	15° 35′	43° 40′
Ğ. er-Rûs	15° 51′	44° 14′
Ğ. es-Samaʿ	15° 35′	44° 17′-44° 22′
Ğ. Saud	15° 49′	43° 50′
Ğ. Sâut	15° 27′	44° 7′
Ğ. Sbaʿîn	15° 56′	43° 42′
Ğ. Sîd	15° 55′	43° 47′
Ğ. Sidâre	15° 59′	43° 49′
Ğ. Sirwahb	15° 32′	43° 52′
Ğ. Sûḳ Ğerbân	15° 36′	44° 3′
Ğ. Šábaḳe	15° 51′	44° 16′
Ğ. Šadab	15° 58′	43° 47′
Ğ. Šahâre	16° 14′	43° 38′
Ğ. eš-Šaḳîḳ	15° 39′	44° 8′
Ğ. Šandûf	15° 43′	43° 46′
Ğ. Šâniğe	15° 41′	44° 10′
Ğ. Šauḳab	15° 46′	43° 56′
Ğ. Šemsân	15° 29′	44° 7′
Ğ. Šuḳbî	15° 37′	43° 49′
Ğ. Ṣalîl	15° 49′	43° 58′-44°
Ğ. Ṣaulân	16° 7′	44° 13′
Ğ. Ṣubâra	16° 8′	44° 15′
Ğ. Ṣubâre	15° 54′	43° 52′
Ğ. Taffa	16° 7′	44° 13′
Ğ. Taʿizz	16° 7′	44° 14′
Ğ. Trijâde	15° 31′	43° 47′
Ğ. Ṯaʿlân	15° 54′	43° 37′
Ğ. Ṯanein	15° 48′-15° 50′	44° 5′
Ğ. Ṯlâ	15° 36′	43° 52′
Ğ. Wakîja	15° 53′	43° 38′
Ğ. Zâfin	15° 39′	43° 47′
Ğ. Zaḥzaḥ	15° 41′	44° 3′

	LATITUDES.	LONGITUDES.
Ğ. Zîla	15° 41′	44° 2′
Ğ. Zulêma	16° 5′	43° 42′
Ğedr	15° 29′	44° 10′
Ğeif el-Balas	15° 39′	44° 13′
el-Ğenâdîb	15° 42′	44° 15′
Ğennât	15° 42′	43° 56′
Ğerbân	15° 36′	44° 3′
Ğirâf	15° 25′	44° 12′
Ğirʿân Bʿ. Sinân	15° 45′	44° 16′
Ğirbet Benî ʿAlî	16° 2′	44° 13′

Ġ

	LATITUDES.	LONGITUDES.
el-Ġail	15° 31′	44° 3′
Ġail ʿAlî	15° 31′	43° 54′
Ġail el-Ḳât	15° 31′	43° 54′
Ġail Metbaʿ	15° 34′	43° 54′
el-Ġamre	15° 52′	43° 51′
Ġûle	15° 54′	44°
el-Ġûle	15° 45′	44° 16′
Ġurze	15° 28′	44° 3′

H

	LATITUDES.	LONGITUDES.
Hâğib	15° 58′	43° 47′
Hállaḳe	15° 31′	43° 55′
Hamdân	15° 25′-15° 30′	43° 54′-44° 6′
Haum	15° 53′	44° 10′
Hiğre	15° 40′	43° 51′
el-Hiğre	15° 38′	43° 38′
Hiğret Benî Ğeiš	15° 58′	43° 46′
Hiğret ibn-Ḥaidar	16° 1′	43° 47′
Hiğret Sajad	15° 52′	44° 5′
Hirma	15° 52′	44° 17′
Hizam	15° 39′	44° 9′
Huâʿ	15° 59′	43° 47′
el-Huḳḳa	15° 34′	44° 9′
Húrube	15° 41′	43° 38′

Ḥ

	LATITUDES.	LONGITUDES.
Ḥabâbe	15° 34′	43° 52′
Ḥabbâr	15° 45′	44° 19′
Ḥabbe	15° 54′	43° 53′
Ḥadaḳân	15° 37′	44° 15′
Ḥaddâd	15° 38′	43° 36′
Ḥaḍûr	15° 20′-15° 24′	43° 57′-44° 4′
Ḥaḍûr eš-Šêḫ	15° 36′	43° 49′
Ḥağar	15° 45′	43° 39′
Ḥağar	16° 7′	44° 14′
el-Ḥağar	15° 49′	44° 6′
Ḥağar Arḥab	15° 50′	44° 15′
Ḥağar Saʿîd	15° 31′	43° 57′
Ḥağe	15° 41′	43° 34′
Ḥâğib	15° 40′	43° 52′
Ḥâğil	15° 28′	44° 8′
Ḥağr ez-Zakâtî	15° 33′	43° 51′
Ḥağz	15° 39′	43° 53′
Ḥaifa	15° 45′	44° 14′
Ḥaiftân	15° 31′	43° 49′
el-Ḥâiṭ	15° 43′	44° 1′
Ḥalamlam el-Aʿlâ	15° 41′	43° 45′
Ḥalḥal	16° 4′	44° 17′
Ḥalḥale	15° 53′	43° 53′
el-Ḥamre	15° 25′	43° 55′
el-Ḥamre	15° 35′	44° 7′
Ḥámuda	15° 53′	43° 59′
Ḥanaḏân	15° 27′	43° 55′
Ḥâriṯ	15° 25′-15° 34′	44° 8′-44° 17′
Ḥâšid	15° 56′-16° 7′	43° 53′-44° 10′
el-Ḥattâb	15° 35′	44° 5′
el-Ḥâurî	15° 32′	44° 8′
Ḥâz	15° 32′	43° 59′
el-Ḥazne	15° 36′	43° 34′
Ḥiğle	15° 36′	43° 58′
Ḥiḳl	15° 52′	43° 48′
el-Ḥille	15° 41′	43° 35′
el-Ḥimeʿ	15° 45′	43° 41′
Ḥuṣn ʿArûs	15° 29′	43° 54′
Ḥuṣn Ḍofîr	15° 45′	43° 33′

	LATITUDES.	LONGITUDES.
	—	—
Ḥuṣn ʿErravent	15° 27′	43° 55′
Ḥuṣn Ġennâbî	15° 58′	43° 47′
Ḥuṣn Ġirʿân Bᵗ. Sinân	15° 45′	44° 16′
Ḥuṣn el-Ġurâb	15° 37′	44° 13′
Ḥuṣn Ḥaḳîl	15° 37′	43° 33′
Ḥuṣn Kafle	15° 43′	43° 32′
Ḥuṣn Kaus	15° 50′	44° 1′
Ḥuṣn Leḳmân	15° 29′	44° 7′
Ḥuṣn Masʿûd	15° 47′	43° 40′
Ḥuṣn en-Nâṣire	15° 36′	43° 52′
Ḥuṣn en-Nufêš	15° 40′	43° 38′
Ḥuṣn Saudân	15° 47′	43° 40′
Ḥuṣn Sened	15° 43′	44° 7′
Ḥuṣn Subâja	15° 31′	43° 53′
Ḥuṣn Sûda	15° 59′	43° 46′
Ḥuṣn Tlâ	15° 35′	43° 53′
Ḥuṣn Ṭawîla	15° 30′	43° 42′

Ḫ

Ḫabt	15° 51′-15° 57′	43° 37′-43° 44′
el-Ḫádare	15° 46′	43° 53′
Ḫállaḳe	15° 32′	43° 55′
Ḫamr	16° 8′	43° 57′
Ḫamîs el-Wâsiṭ	15° 47′-15° 49′	44° 8′-44° 12′
Ḫarâb Abjan	15° 46′	44° 10′
Ḫarâb Bᵗ. el-Ġirejre	15° 28′	43° 46′
Ḫarâb Ḥaǧar Ḍân	15° 46′	44° 10′
Ḫarâb Ibn Ṣâliḥ ʿAlî	15° 50′	43° 56′
Ḫarâb Kâsim	15° 39′	43° 59′
Ḫarâb Ḳaṣr	15° 37′	43° 59′
Ḫarâb Lahaǧ	15° 46′	44° 9′
Ḫarâb el-Lákame	15° 37′	43° 59′
Ḫarâb Liḥf el-Ḫait	15° 50′	43° 56′
Ḫarâb Mâreʿ	15° 41′	44° 2′
Ḫarâb Masán	15° 59′	43° 46′
Ḫarâb Mermel	15° 40′	44° 3′
Ḫarâb Raḥbân	15° 35′	43° 58′
Ḫarâb er-Rbáḥâ	15° 37′	43° 57′

	LATITUDES.	LONGITUDES.
	—	—
Ḫarâb es-Saude	15° 44′	44° 1′
Ḫarâb Šâhid	15° 45′	44° 4′
Ḫarâb Šemr	15° 41′	43° 47′
Ḫarâb Šiʿb	15° 50′	43° 55′
Ḫarâb Šîbe	15° 37′	43° 59′
Ḫarâb Šîr	15° 50′	43° 56′
Ḫarâb es-Ṣajad	15° 35′	44° 2′
Ḫarâb Ṣalûl	15° 37′	44°
Ḫarâb et-Ṯaub	15° 53′	43° 55′
Ḫarâb et-Ṯûmî	15° 51′	43° 54′
Ḫarâb el-Wahbe	15° 53′	43° 56′
Ḫubbe	15° 42′	44° 5′-44° 8′
el-Ḫuff	16°	43° 46′

I

Ibn ʿAmrân	15° 59′	43° 48′
Ibr el-Ġâr	15° 47′	43° 41′

ʿI

ʿIbâl	15° 45′	43° 32′
el-ʿIbâl	15° 42′	43° 41′
ʿIdân	15° 40′	43° 58′
ʿIršan	15° 45′	44° 17′
ʿIšâḳ	15° 57′	43° 47′
ʿIzzân	15° 42′	43° 44′

J

Ješîʿ	15° 54′	43° 55′

K

el-Karâdîn	15° 37′	43° 54′
Kaukabân (Ḥaǧe)	15° 42′	43° 36′
Kaukabân (Šibâm)	15° 31′	43° 53′
K.[1] ʿArûs	15° 40′	44° 8′

[1] Kaulat.

	LATITUDES.	LONGITUDES.
K. ʿAsejkir	15° 33′	44°
K. Bᵗ. el-Ḳuṭeibî	15° 44′	44° 5′
K. Bᵗ. Ṯínna	15° 40′	44° 7′
K. Darʿa	15° 39′	44° 4′
K. ed-Dirre	15° 31′	44° 10′
K. eḍ-Ḍâḥa	15° 42′	44° 3′
K. eḍ-Ḍubâ	15° 44′	44° 6′
K. el-ʿErrân	15° 33′	43° 59′
K. el-Fuḳrain	15° 41′	44° 5′
K. Ǧerbatên	15° 40′	44° 4′
K. Ġazâl	15° 44′	44° 6′
K. el-Ġirbâbe	15° 48′	44° 5′
K. Hizam	15° 38′	44° 9′
K. Ḫattâb	15° 39′	44° 5′
K. el-Ḫâurî	15° 31′	44° 8′
K. Ḥumeiriân	15° 39′	44° 8′
K. Kudeisî	15° 40′	44° 2′
K. Mikâb	15° 38′	44° 2′
K. Munaḳḳeb	15° 30′	44°
K. Naurân	15° 45′	44° 3′
K. er-Rummân	15° 40′	44° 5′
K. Sâlim	15° 47′	44° 8′
K. es-Sfîjatein	15° 45′	44° 3′
K. Suǧeje	15° 44′	44° 3′
K. Sumein	15° 41′	44° 5′
K. Zâʿai	15° 48′	44° 7′
K. Zilî	15° 47′	44° 6′
Kijâl el-Ḥuḳûb	15° 44′	44° 7′
Kijâl Bᵗ. el-Ḥadir	15° 50′	44° 9′
Koḥlân	15° 43′	43° 42′
Kúhur	15° 41′	43° 46′
el-Kurbât	15° 37′	43° 58′

Ḳ

el-Ḳâʿa	15° 40′	43° 52′
Ḳâʿa el-Arbaʿîn	15° 41′-15° 42′	44° 7′-44° 9′
Ḳâʿa el-ʿAǧma	15° 35′-15° 38′	44° 4′
Ḳâʿa ʿAsejkir	15° 34′-15° 35′	43° 59′-44° 3′

	LATITUDES.	LONGITUDES.
Ḳâʿa el-Baun	15° 40′-15° 50′	43° 54′-44° 3′
Ḳâʿa el-Berîk	15° 46′-15° 48′	44° 7′
Ḳâʿa Ḏânib	15° 51′	43° 52′
Ḳâʿa Ḏarḥân	15° 55′-15° 56′	43° 43′-43° 45′
Ḳâʿa Ǧirʿa	15° 30′	43° 55′
Ḳâʿa el-Ġarîb	15° 45′	44° 5′-44° 7′
Ḳâʿa Ġurze	15° 27′	44°-44° 3′
Ḳâʿa Haum	15° 51′-15° 54′	44° 10′-44° 11′
Ḳâʿa Ḥais	15° 52′-15° 56′	44° 2′-44° 5′
Ḳâʿa Ḥamrâ	15° 43′-15° 45′	44° 8′-44° 13′
Ḳâʿa Ḥams	15° 43′	44° 4′
Ḳâʿa Ḥámuda	15° 52′	43° 56′-44° 1′
Ḳâʿa Ḥaušân	15° 34′	43° 52′-43° 55′
Ḳâʿa Ḥmeidân	15° 58′	43° 49′
Ḳâʿa Ḫádare	15° 46′	43° 52′
Ḳâʿa Kalâbî	15° 53′-15° 54′	43° 45′-43° 48′
Ḳâʿa el-Ḳaṣrein	15° 47′	43° 50′-43° 54′
Ḳâʿa Madám	15° 55′	44° 10′
Ḳâʿa Mermel	15° 39′-15° 42′	44° 3′
Ḳâʿa el-Mikâb	15° 39′	44° 1′
Ḳâʿa Munaḳḳeb	15° 29′	43° 59′-44° 3′
Ḳâʿa er-Riḳḳa	15° 31′-15° 33′	44° 4′-44° 10′
Ḳâʿa es-Sah	15° 48′	44° 5′
Ḳâʿa Saḥab	15° 38′-15° 39′	43° 57′-44°
Ḳâʿa Semne	15° 37′-15° 40′	44° 15′-44° 22′
Ḳâʿa Šaʿb	15° 49′	43° 56′
Ḳâʿa eš-Šems	16°-16° 5′	44° 5′-44° 12′
Ḳâʿa Ṣâfija	15° 32′	43° 54′
Ḳâbil	15° 28′	44° 7′
el-Ḳâbile	15° 43′	43° 52′
Ḳadáf	15° 45′	43° 33′
Ḳaflet el-Ḳuḏûb	15° 51′	43° 52′
Ḳâhira	16° 7′	44° 14′
Ḳaidân	15° 49′	43° 38′
el-Ḳaile	15° 44′	43° 32′
Ḳalʿat eš-Šerâḳî	15° 41′	43° 35′
Ḳalliṭ	15° 49′	43° 48′
el-Ḳarân	16°	43° 48′
Ḳaránṭel	15° 58′	43° 47′

	LATITUDES.	LONGITUDES.
el-Ḳarâre	15° 40′	43° 32′
el-Ḳâre	15° 54′	43° 49′
Ḳâretên	15° 57′	43° 49′
Ḳârin	15° 41′	43° 48′
el-Ḳarja	15° 53′	44° 8′
Ḳarjat ibn-Ḥâǧib	15° 50′	44° 6′
Ḳarjat Salm	15° 40′	44° 9′
el-Ḳarjatîn	15° 37′	43° 55′
Ḳarn el-Jahûdî	15° 54′	43° 49′
el-Ḳaṣr (Abraḳ)	15° 48′	43° 55′
el-Ḳaṣr Ǧennât	15° 43′	43° 56′
el-Ḳaṣr (Mermel)	15° 40′	44° 3′
Ḳaṣr ʿAlî ibn Ḥamze	15° 43′	43° 55′
Ḳassaba ʿIḏâke	15° 36′	43° 41′
Ḳaṭʿat ʿIzzân	15° 42′-15° 43′	43° 43′-43° 45′
Ḳaṭwân	15° 52′	44° 11′
Ḳawâre	15° 54′	44° 7′
Ḳimma	15° 42′	43° 42′
Ḳîne	15° 45′	43° 58′
Ḳirjet el-Ešmûr	15° 41′	43° 47′
Ḳirjet el-Lákame	15° 27′	43° 56′
Ḳudam	15° 43′	43° 37′
Ḳúdam	15° 46′-15° 51′	43° 42′-43° 45′
el-Ḳufl	15° 37′	43° 39′
el-Ḳufl (Ẓafâr)	16° 7′	44° 14′
Ḳuḥâl	15° 42′	44°
el-Ḳumâme	15° 37′	43° 50′
Ḳumre	15° 58′	43° 47′

L

Liǧâm	15° 34′	43° 55′
Liǧâm (Nâʿaṭ)	15° 47′	44° 5′
Loǧâba	15° 41′	43° 53′
Lômî	15° 51′	43° 55′
Lúluh	15° 24′	44° 2′

M

Mabjan	15° 44′	43° 32′

	LATITUDES.	LONGITUDES.
Madâm	15° 31′	44° 5′
Maḏâba	15° 45′	43° 40′
el-Maʿḏabe	15° 51′	43° 44′
Maḏbaḥ	15° 24′	44° 9′
Maḏraḥ	15° 53′	43° 49′
Maǧarre	15° 31′	43° 41′
el-Máǧebe	15° 36′	43° 38′
el-Maǧrabe	15° 49′	43° 40′
el-Mahâlî	15° 37′	43° 52′
Maḥaṭṭa	15° 49′	43° 53′
el-Mâhaḏ	15° 39′	43° 52′
Maḥáir	15° 58′	43° 47′
el-Maḥǧir	15° 45′	43° 58′
Maḥill	15° 49′	44° 21′
el-Maḥm	15° 49′	44° 3′
Maḥṣam	15° 53′	44° 15′
Maisân	15° 37′	43° 38′
Makârib	15° 40′	44° 13′
Maḳʿad	16°	43° 48′
Mallaḥa	15° 45′	43° 54′
el-Maʿmer	15° 33′	44° 6′
el-Maʿmer	15° 44′	43° 55′
el-Maʿmer Neǧr	15° 40′	43° 55′
Manḏar	15° 44′	43° 36′
Manṣûr	15° 55′-15° 58′	43° 47′-43° 50′
Marâbeṭ el-Ḥail	15° 58′	44° 11′
Marbaḏa	15° 52′	43° 47′
Marḳas	16°	43° 47′
el-Mʿâṣfîn	15° 57′	43° 48′
Maṣnaʿa	15° 49′	43° 39′
Maṣnaʿa	15° 51′	43° 56′
Maṭrad	15° 54′	43° 56′
Medaʿ	15° 38′	43° 49′
el-Medîna	15° 35′	43° 44′
Medînet el-Kuffâr	15° 43′	43° 54′
Medînet eṣ-Ṣallît	15° 43′	43° 58′
Medînet Tulḳum	15° 50′	44° 2′
el-Medînetein	15° 43′	44° 7′
Medr	15° 49′	44° 15′

	LATITUDES.	LONGITUDES.
Medrese	15° 31′	43° 53′
Meǧennet el-Jahûd	15° 28′	43° 54′
el-Menkîf	15° 46′	43° 41′
Menkît	16°	43° 47′
Merred el-Ġêl	15° 25′	44° 2′
Mesâǧid	15° 20′	44° 3′
Mesǧid el-Hâriṯ	15° 31′	43° 53′
Mesǧid ez-Ẓâhir	15° 29′	43° 42′
Mesǧid Zijâdî	15° 30′	43° 54′
el-Mešîr	15° 30′	43° 53′
Mîka‘	16°	43° 51′
Mind	15° 18′	44° 2′
Minǧide	15° 47′	44° 2′
Mirḥa	15° 38′	43° 55′
Mizdid	15° 29′	43° 45′
Mšâib	15° 44′	43° 39′
Mṣallâ	15° 58′	43° 47′
Munaḳḳeb	15° 30′	44°

N

Na‘ân	15° 41′	43° 59′
Nâ‘aṭ	15° 47′	44° 6′
Nadâ‘	15° 33′	43° 49′
Na‘mân	15° 40′	43° 35′
Naḳam	15° 57′	43° 48′
Naufân	15° 54′	43° 50′
Neǧd ez-Zebîb	15° 43′	44° 6′
Neǧr	15° 40′	43° 56′
Nešeme	15° 55′	43° 49′
Nuḥbe	15° 58′	43° 47′

‘O

el-‘Oḳâfî	15° 44′	43° 33′
el-‘Orre	15° 44′	43° 39′
‘Osâm	15° 45′	44° 12′
‘Oṯmân	15° 58′	43° 48′

R

	LATITUDES.	LONGITUDES.
Raǧau	15° 50′	44° 10′
Râs en-Naḳîl	15° 32′	43° 47′
Rauḍa	15° 27′	44° 13′
Rebed	15° 47′	43° 39′
Rêde	15° 50′	44° 2′
Refîḳ	15° 53′	44° 16′
Rehêḳe	15° 57′	43° 47′
Riâm	15° 51′	44° 19′
Rû‘	15° 37′	43° 59′
er-Rubṭ	15° 51′	44° 21′
Rukn	15° 47′	43° 40′
Rumeiḥ	15° 35′	43° 39′
Ruweis	15° 57′	43° 48′

S

Sâlim	15° 58′	43° 47′
Sama‘	15° 37′	43° 38′
Sama‘	15° 49′	43° 48′
Saud	15° 50′	43° 50′
Saud (Ḳarn el-‘Afîf)	15° 49′	43° 50′
Saudân	15° 56′	44° 3′
Sawâd	15° 24′	44° 9′
Sawâd	15° 33′	43° 56′
es-Sawâdên	15° 45′	43° 56′
Seil el-Ḥabâbe	15° 33′	43° 53′
Seil Maǧarre	15° 32′	43° 40′
Seil Šu‘ûb	15° 32′	44° 13′
Seil eṣ-Ṣârabî	15° 34′	43° 38′
Seil eṣ-Ṣîn	15° 36′	43° 54′
Semsera Ġerbân	15° 36′	44° 2′
Semsera (Ḳâ‘a er-Riḳḳa)	15° 32′	44° 8′
Semsera (Ṭawîla)	15° 30′	43° 42′
Sir‘auf	15° 51′	43° 51′
Sûda	15° 59′	43° 46′
Sûdat Arḥab	15° 52′	44° 20′
Sûdat ‘Ajâl ‘Abdille	15° 56′	44° 14′
Sûdat Ḥâšid	15° 53′	44° 7′
Sûḳ (Ḥaǧe)	15° 40′	43° 34′

	LATITUDES.	LONGITUDES.
Sûḳ el-Ḫamîs (Ḥalḥal)	16° 3′	44° 17′
Sûḳ Bᵗ. ʿIdâḳe	15° 36′	43° 42′
Sûḳ (Koḥlân)	15° 43′	43° 42′
Sûḳ es-Samîl	15° 36′	43° 43′
Sûḳ (Šibâm)	15° 32′	43° 53′
Sûḳ el-Wâdî	15° 27′	44° 7′
Suna	15° 31′	43° 53′

Š

Šaʿb (Lômî)	15° 37′	44° 14′
Šaʿb (Ḳâʿa Semne)	15° 50′	43° 56′
Šaʿb Ḍêfân	15° 43′	44° 4′
Šaʿbet Bᵗ. Rizḳân	15° 31′	43° 52′
Šaʿbet Ḍábaḥ	15° 32′	43° 53′
Šahâra	16° 14′	43° 40′
Šahrân	15° 51′	43° 52′
Šâmeʿ	15° 44′	43° 33′
Šaʿr	15° 56′	43° 48′
Šaurîja	15° 43′	43° 32′
Šêbere	15° 53′	44° 2′
Šemsân	15° 42′	43° 32′
Šemsân Benî Ǧeiš	15° 58′	43° 46′
eš-Šeraḳî	15° 38′	43° 36′
Šeres	15° 43′	43° 38′
Šeṣṣarîm	15° 57′	44° 12′
Šhîm	15° 36′	43° 51′
Šibâm	15° 32′	43° 53′

Ṣ

Ṣaddân	16° 6′	44° 17′
eṣ-Ṣâfî	15° 36′	43° 45′
eṣ-Ṣâja (Ḥaǧe)	15° 42′	43° 32′
eṣ-Ṣâja (ʿAffâr)	15° 48′	43° 39′
Ṣanʿâ	15° 22′	44° 12′
Ṣarâre	15° 49′	43° 52′
Ṣaʿṣa	15° 40′	43° 34′
Ṣfâ Ḳeḥlîl	15° 32′	43° 47′
eṣ-Ṣfîf	15° 43′	44° 7′

	LATITUDES.	LONGITUDES.
Ṣirwâḥ	15° 50′	44° 15′
eṣ-Ṣurb	15° 34′	43° 54′

T

Talâbe	15° 26′	43° 57′
Tiḳrârî	15° 38′	43° 58′
Trijâde	15° 30′	43° 46′

Ṯ

Ṯaḳbân	15° 27′	44° 10′
Ṯalûṯ Lâʿa	15° 33′	43° 41′
Ṯlâ	15° 36′	43° 53′
Ṯuluṯ	15° 47′	43° 50′-43° 55′

Ṭ

Ṭaïba	15° 27′	44° 5′
Ṭaïba ed-Dâḫilîja	15° 27′	44° 5′
Ṭaïba el-Ḫâriǧîja	15° 27′	44° 5′
eṭ-Ṭauf	15° 54′	43° 49′
Ṭawîla	15° 30′	43° 42′

ʿU

ʿÛlî	15° 37′	43° 56′
ʿUnja	15° 39′	43° 35′

W

Wâdî	15° 52′	43° 52′
W. (1) Aḥraf	15° 58′	43° 41′
W. Ándar	15° 38′	43° 40′
W. Asʿad	15° 46′	43° 39′
W. el-Azrûb	15° 56′	43° 50′
W. el-ʿAder	15° 32′	43° 53′
W. ʿAjâl ʿAlî	15° 34′	43° 43′

(1) Wâdî.

	LATITUDES.	LONGITUDES.
W. ʿAjâl Ḥâtim	15° 42′	43° 52′
W. ʿAjâl Mûmar	15° 34′	43° 42′
W. ʿAjjân	15° 40′	43° 33′
W. ʿAkkâr	15° 43′	43° 51′
W. ʿAráwer	15° 29′	43° 46′
W. ʿAšab	15° 41′	43° 43′
W. ʿAṭṭâf	16° 7′	44° 20′
W. Bâb el-Feğrên	15° 29′	43° 56′
W. Baḍʿa	15° 33′	43° 50′
W. Bᵗ. el-Kaulî	15° 43′	43° 41′
W. Bᵗ. Kadam	15° 42′	43° 39′
W. Bᵗ. Kilâb	15° 54′	43° 50′
W. Bel ʿÂsirîn	15° 38′	43° 34′
W. Benî ʿAlî	15° 57′	43° 45′
W. Benî ʿAšab	15° 41′	43° 43′
W. Benî Ḥawár	15° 38′	43° 41′
W. Benî Ḳudeil	15° 45′	43° 46′
W. Bukúr	15° 33′	43° 47′
W. Ḍî Bîn	16° 7′	44° 11′
W. Ḍahr	15° 26′, 15° 28′	44° 3′, 44° 8′
W. Ḍajân	15° 38′	43° 55′
W. Ḍarḥân (Sûda)	15° 56′	43° 46′
W. Ḍarḥân (Šibâm)	15° 28′	43° 57′
W. Ḍejbe	15° 52′	43° 52′
W. Ḍulâʿ	15° 25′	44° 8′
W. Fôḳâm	15° 50′	44° 5′
W. Ġabîb	15° 39′	44° 2′
W. Ġazwân	15° 31′, 15° 32′	43° 51′, 43° 49′
W. Ġûle	15° 46′	43° 54′
W. el-Hâše	15° 40′	43° 34′
W. Hiğle	15° 34′	43° 36′
W. el-Hiğre	15° 39′	43° 50′
W. Húrube	15° 41′	43° 36′
W. Ḥabarân	15° 44′	43° 43′
W. Ḥabṭ	15° 53′	44° 18′
W. Ḥaḍûr	15° 35′	43° 50′
W. Ḥaiḍan	15° 32′	43° 58′
W. Ḥalḥâl (Ḍofîr)	15° 44′	43° 36′
W. Ḥalḥal	16° 1′	44° 17′

	LATITUDES.	LONGITUDES.
W. Ḥammâm	16° 2′	43° 50′
W. el-Ḥamûdî	15° 43′	43° 53′
W. Ḥanîa	15° 42′	44° 1′
W. Ḥanit	15° 45′	43° 43′
W. Ḥaumerî	15° 58′	43° 51′
W. Ḥazâmir	15° 35′	43° 58′
W. Ḥsêb	15° 39′	43° 30′
W. Ḥšerr	15° 40′, 15° 41′	43° 36′, 43° 38′
W. Ḥállaḳe	15° 33′	43° 56′
W. Ḥârid	15° 39′	44° 23′
W. Inkaf	15° 51′	43° 53′
W. Kailab	15° 39′	43° 43′
W. Kalâbî	15° 54′	43° 46′
W. Kaltabî	15° 31′	43° 51′
W. Ḳâni	15° 47′	44° 5′
W. Ḳaraḍe	15° 54′	43° 52′
W. el-Ḳâre	15° 38′	43° 39′
W. Ḳârin	15° 41′	43° 51′
W. Ḳufl	15° 43′	43° 36′
W. Ḳumâme	15° 35′	43° 51′
W. Ḳutâba	15° 47′	43° 42′
W. Lâʿa	15° 32′, 15° 34′	43° 34′, 43° 47′
W. Laḥağ	15° 47′	44° 10′
W. Liğâm (Ğ. Ḍulâʿ)	15° 31′	43° 52′
W. Liğâm	15° 48′	44° 4′
W. Liğm	15° 42′	43° 37′
W. Liğme	15° 38′	43° 52′
W. Lubab	15° 47′	43° 42′
W. Maʿajjane	15° 40′	43° 39′
W. Maḍrin	15° 49′	44° 13′
W. Mafâḍ	15° 47′	43° 47′
W. Mağsal	15° 48′	43° 41′
W. Mahrab	15° 41′	43° 43′
W. Maḥdâm	15° 49′	44° 7′
W. Maḥraṣ	15° 56′	43° 51′
W. Maḥṣam	15° 54′	44° 16′
W. el-Maḥzaʿ	15° 39′	43° 59′
W. el-Mâḥaḍ	15° 38′	43° 50′
W. Mâʿkir	15° 29′	43° 38′

	LATITUDES.	LONGITUDES.
W. Maᶜsâr	15° 42′	43° 34′
W. Maur	15° 59′	43° 30′
W. Máwir	15° 43′	43° 39′
W. Ménsib	15° 36′	43° 52′
W. Msállam	15° 45′	43° 39′
W. Muᶜajan	15° 59′	43° 47′
W. Nabhân	15° 31′	43° 53′
W. Naᶜîm	15° 30′	43° 53′
W. Naᶜwân	15° 28′	43° 48′
W. Neğâr	15° 40′	43° 32′
W. Neğr	15° 39′	43° 56′
W. Neḳᶜa	15° 46′	43° 39′
W. Niššan	15° 54′	43° 39′
W. el-ᶜOḏḏa	15° 40′	44° 3′
W. ᶜOṯmân	15° 58′	43° 50′
W. Raḥbân	15° 38′	43° 33′
W. Raṣâṣ	15° 39′	43° 57′
W. Rûᶜ	15° 38′	43° 58′
W. Saġ	15° 43′	43° 38′
W. Sálab	15° 38′	43° 52′
W. Salâme	15° 42′	43° 37′
W. es-Sawâil	15° 43′	43° 35′
W. Shêl	15° 33′	43° 47′
W. Sirrî	15° 38′	43° 57′
W. Šabbân	15° 49′	43° 57′
W. Šahrân	15° 50′	43° 51′
W. Šamajân	16° 1′	43° 46′
W. Šamîm	15° 52′	43° 49′
W. Šauḳab	15° 47′	43° 56′
W. Šáwar	15° 56′	43° 48′
W. Šeres	15° 43′	43° 37′
W. eš-Šerkî	15° 54′	43° 43′
W. Šhîm	15° 35′	43° 51′
W. Šwâba	16° 6′	44° 15′
W. eṣ-Ṣâfia	15° 43′	44° 2′
W. Ṣálabe	15° 45′	43° 37′
W. Ṣubâre	15° 53′	43° 52′
W. Taḫmud	15° 45′	43° 31′
W. Ṯaᶜlân	15° 54′	43° 34′

	LATITUDES.	LONGITUDES.
W. Ṯeğe	16°	43° 47′
W. ᶜUmjân	15° 52′	43° 41′
W. Warwar	16° 8′	44° 14′
Waᶜle	15° 48′	44° 2′
Waṯik	15° 49′	43° 51′
Welî Ḫâlid	15° 49′	44° 5′
Wérrik	15° 41′	43° 57′

Z

Zâfin	15° 40′	43° 47′
Zubbâd	15° 55′	44° 10′
Zubeirât	15° 45′	44° 21′

Ẓ

Ẓafâr	16° 7′	44° 15′
Ẓahrein	15° 41′	43° 34′
eẓ-Ẓubr	15° 43′	43° 56′
Ẓubr Ḥâšid	15° 49′	44° 3′

ALPHABETICAL INDEX OF ALL THE NAMES

OF PLACES WHICH APPEAR IN THE TEXT.

[1] Ğebl.

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(1) Wâdî.

GENERAL INDEX

INDEX OF PERSONS AND THINGS.

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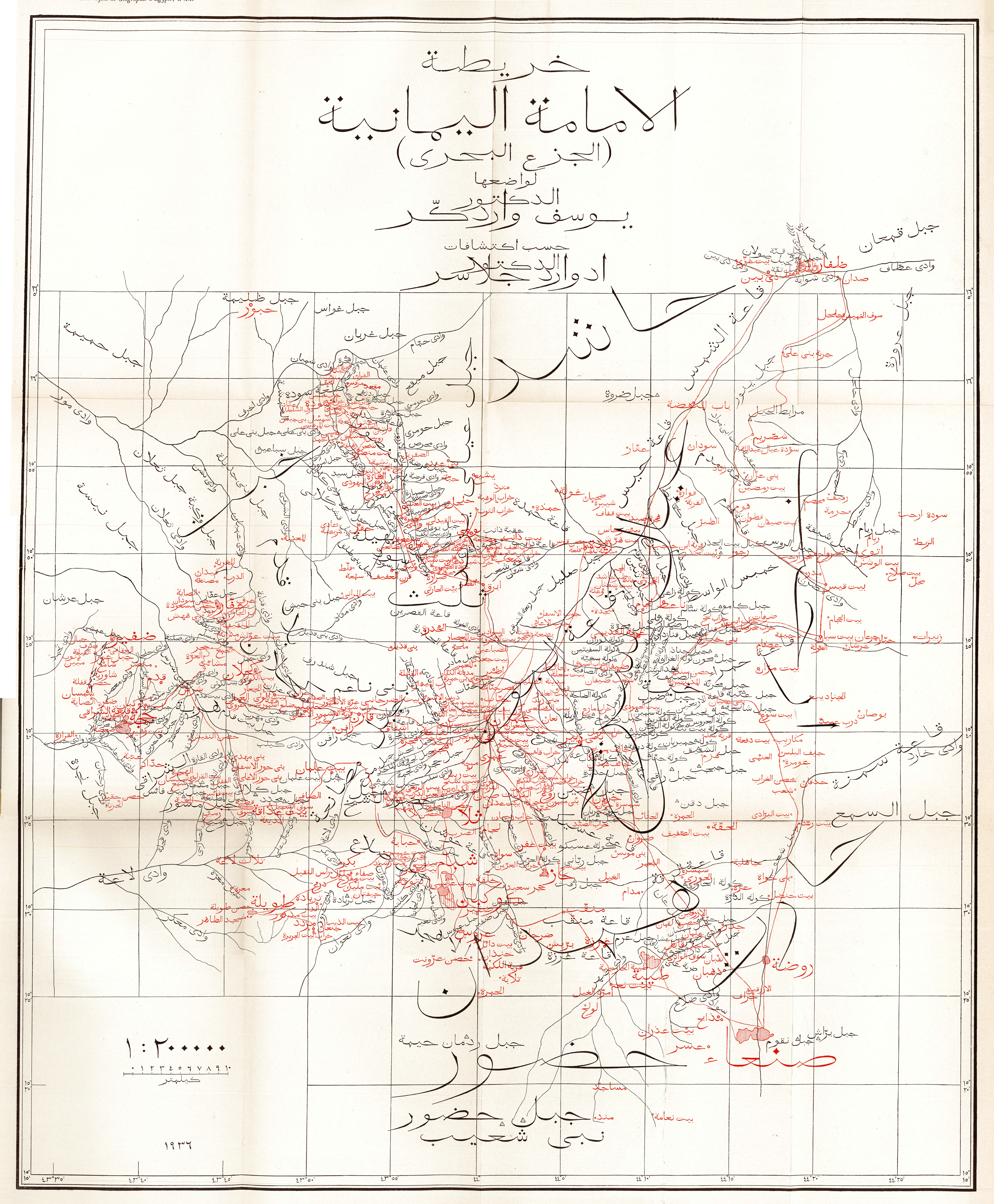
V

W

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MAP OF PART
OF
NORTH-WEST YEMEN
BASED
ON THE RESULTS OF THE EXPLORATION
UNDERTAKEN BY EDUARD GLASER
FROM OCTOBER 1883 TO FEBRUARY 1884
DRAWN AND EXECUTED
BY JOSEF WERDECKER (1933)
1 : 200000
Ǧ. Šahâre
Šahâra
Ǧ. Ǧemîme
Ǧ. Zulêma
Ǧ. Ǧuwâs
Ǧ. Ǧurbân
Ǧ. Derwe
Ǧ. Aršân
Ḥaǧe
Ǧ. Miswer
Ǧ. Maṣâna'a
Ḥadûr eš-Šêḫ
Tila
Ǧ. Nisa
TULUT
Amrân
Ṭawîla
Kaukabân
Ǧ. Durb
Ǧ. es-Sama'
Rauḍa
Ṣan'â
Ǧ. Hadûr
Nebbî Šu'aib
Ǧ. Radmân Ḥaime


خريطة
الامامة اليمانية
(الجزء البحرى)
لواضعها
الدكتور
يوسف واردكر
حسب اكتشافات
الدكتور
ادوارد جلاسر
١ : ٢٠٠٠٠٠
كيلمتر
١٩٣٦
صنعاء
حضور
جبل حضور
نبى شعيب



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